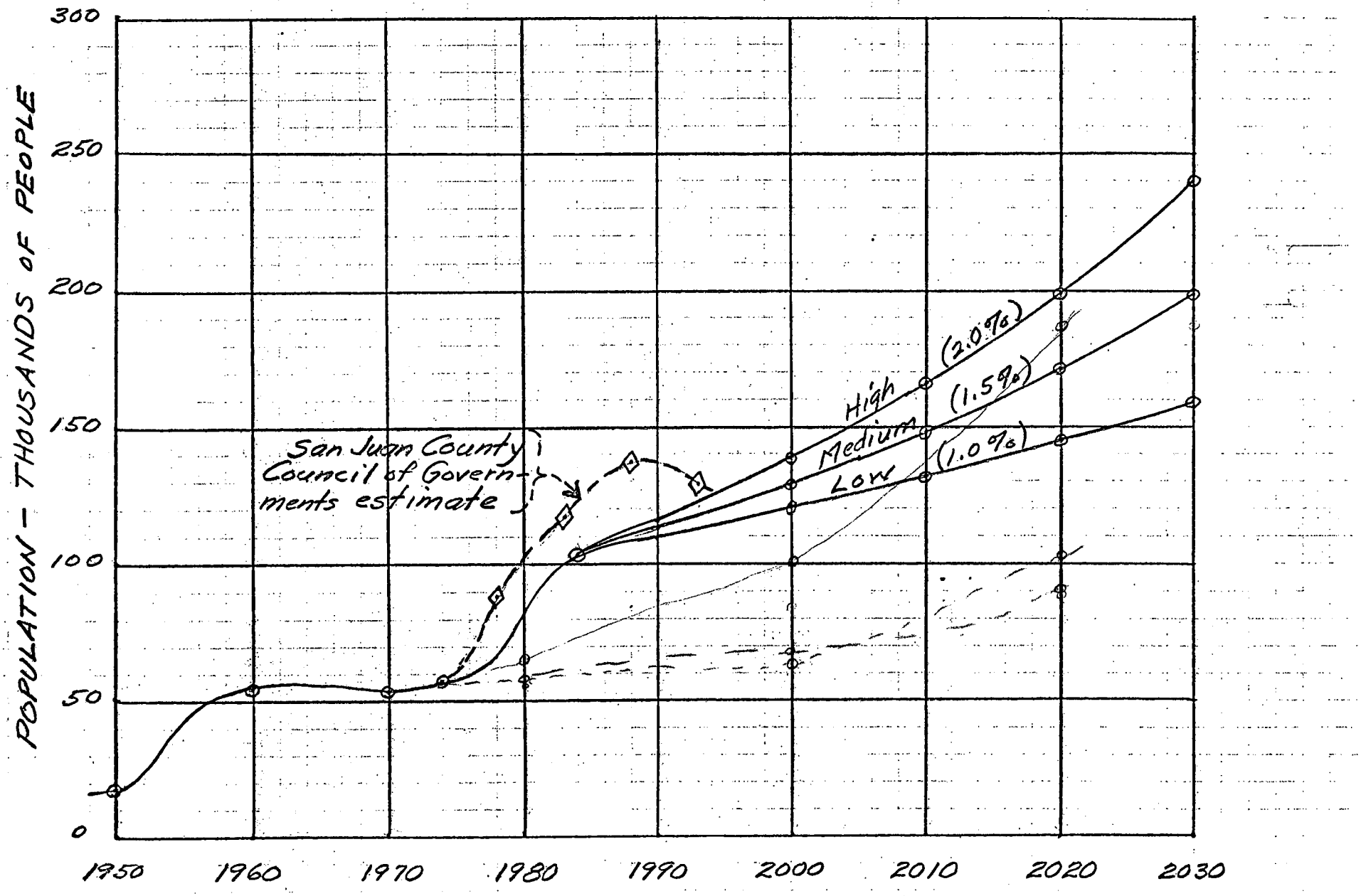
POPULATION ESTIMATES
SAN JUAN COUNTY, NEW MEXICO



OSE-1019

Water Available to San Juan County, N. Mex. From Animas-La Plata Project for Municipal & Rural Domestic Needs

Population
1974 — 57,000
Increase by 1984
Primary jobs — 10,000 [1]
Secondary jobs (10,000 × 2/3 [2]) — 6,700
Total jobs — 16,700

Population (16,700 × 2.75 [3]) — 45,900

Total County population by 1984 — 102,900

Low, Medium & High Projects based on 1.0%, 1½% & 2% annual increase compounded each 10 years after 1984

Population

Year	Census data	Estimate Low (1% increase)	Estimate Medium (1½% increase)	Estimate High (2% increase)
1950	18,292			
1960	53,306			
1970	52,517			
74		57,000	157,000	157,000
84		102,900	102,900	102,900
90		109,074	112,161	115,248
2000		119,981	128,985	138,298
2010		131,979	148,333	165,958
2020		145,177	170,583	199,150
2030		159,695	198,470	238,980

Assuming the following water would be available:

Existing supplies [5] — 27,000 ac.-ft.
Animas-La Plata Project — 35,000 ac.-ft.(±)
Total — 62,000 ac.-ft.

The rate of use in the year 2030 could be as follows:

Population estimate		People	Available water per capita [4] Ac.-ft./yr.	Gals./day
Low	1.0	160,000	0.388	346
Medium	1.5	198,500	0.312	279
High	2.0	239,000	0.259	231

(Continued)

OSE-1020

Sheet 2 of

Water Available to San Juan County, N. Mex. From Animas-La Plata Project For Municipal & Rural Domestic Needs

Foot notes for sheet 1:

1/ Estimated by Farmington Industrial Dev. Service Refer to attached table.

2/ Multiplyer obtained from "The Roll of Employment and Income Multiplyers in Selecting Agricultural Development Oportunities for Four-Corners Region", May 1971 By N. Mex. State University.

3/ Multiplyer obtained by considering the following:

	1970 Population	1970 Work Force	Multiplyer (Pop. ÷ W.F.)
San Juan Co., N. Mex.	52,519	15,265	3.44
La Plata Co., Colo	19,199	6,324	3.04
Montezuma Co., Colo.	12,952	4,523	2.86
Denver Metro Area	1,227,529	531,900	2.31

4/ The estimated 26,000 people in Farmington used about 7,700 acre-feet of treated water in 1973. This amounts to 265 gallons per capita per day.

San Juan County
Industrial Employment
1974 - 1983

FARMINGTON INDUSTRIAL DEVELOPMENT SERVICE, INC.
P. O. BOX 900
FARMINGTON, NEW MEXICO 87401

-construction o-operation
Jobs in force end of 1973

974		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
159	El Paso Gasification	c/o 774	c/o 4,234	c/o 7,014	c/o 5,514	c/o 1,974	o 2,383	o 2,383	o 2,383	o 2,398	o 2,398
-0-	Wesco Gasification	c 1,500	c 3,000	c/o 3,300	c/o 3,612	c/o 3,912	c/o 4,224	c/o 4,524	c/o 4,836	c/o 3,636	o 2,448
178	*Utah International	o 478	o 478	o 478	o 878	o 878	o 1,278	o 1,278	o 1,678	o 1,678	o 2,078
410	*Arizona Public Service Co. Four Corners Power Plant	o 360	o 410	o 460	o 460	o 460	o 460	o 460	o 460	o 460	o 460
400	Four Corners Power Plant	c 400	c 400	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
227	*Public Service Co. of N. M.	o 169	o 183	o 244	o 281	o 360	o 360	o 360	o 360	o 360	o 360
150	Public Service Co. of N. M.	c 1,130	c 1,710	c 1,310	c 1,160	c 580	-0-	-0-	-0-	-0-	-0-
705	Bureau of Reclamation NIIP	c 900	c 1,060	c 1,080	c 1,080	c 1,060	c 740	c 740	c 740	c 740	c 740
105	Government Employment NIIP	o 105	o 105	o 115	o 115	o 115	o 90	o 90	o 90	o 90	o 90
10	BIA - NIIP	o 10	o 30	o 31	o 32	o 33	o 34	o 35	o 36	o 37	o 38
49	*NAPI - NIIP	o 80	o 238	o 438	o 638	o 838	o 1,038	o 1,238	o 1,438	o 1,638	o 1,838
61	*Vinnell Corp. - NIIP	c 61	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
160	*Rosick Corp. - NIIP	c 160	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
14	TOTALS	6,127	11,848	14,470	13,770	10,210	10,607	11,108	12,021	11,037	10,450

OSE-1022

NEW MEXICO STATE WATER PLAN
COUNTY DATA
SAN JUAN COUNTY

TABLE 7. BBR-1968 LEVEL OF PROJECTIONS

Total County Population (18)	1970-Census	1980	2000	2020
	52,517	66,200	100,500	175,000
Urban	25,333	40,800	75,100	149,600
Rural	27,184	25,400	25,400	25,400

Present and Projected Water Requirements (1000 acre-feet)

	1970		1980		2000		2020	
	Div	Depl	Div	Depl	Div	Depl	Div	Depl
Total Urban	8.8	3.9 ✓	14.6	10.1	24.7	17.5	44.4	33.5
San Juan Co.	8.8	(3.9)	9.1	4.6	17.7	10.5	36.9	26.0
Export (McKinley)	0	(0)	5.5	5.5	7.0	7.0	7.5	7.5
Rural	2.4	1.1 1.4	1.7	1.1	2.0	1.4	2.3	1.7
Manufacturing	.4	.2 ✓	.4	.2	.6	.3	1.9	1.1
Fish and Wildlife	2.7	1.0 ✓	3.1	1.4	14.3	12.6	14.3	12.6
Irrigation*	208.0	79.4 80.4	428.3	200.0	759.2	370.0	742.9	370.0
Minerals	5.7	2.2 2.3	48.7	43.4	75.7	70.4	80.7	74.5
Military	0	0	0	0	0	0	0	0
Livestock	.5	.5 .8	.5	.5	.7	.7	.9	.9
Reservoir Evap. 1/	23.5	23.5 24.2	27.9	27.9	27.9	27.9	27.9	27.9
Stock Pond Evap.	2.3	2.3 3.5	2.7	2.7	3.1	3.1	3.1	3.1
Res. Evap. -Import	0	0	2.5	2.5	4.1	4.1	4.1	4.1
Power 2/	24.7	16.4 ✓	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~
				49.0		71.9		139.8
Requirements		130.5						

*Base year flow for irrigation is 1969, Indian lands are not taken out of production to meet increased non-agricultural requirements

1/ Multi-purpose and other such as M&I reservoirs

~~2/ 1970 Diversions and depletions for power are reflected in future time frames~~

NEW MEXICO STATE WATER PLAN
COUNTY DATA
SAN JUAN COUNTY

Page

TABLE 8. - OBERS 1968 LEVEL OF PROJECTIONS

	1970-Census	1980	2000	2020
Total County Population (18)	52,517	53,400	66,700	104,300
Urban	25,333	28,000	41,300	78,900
Rural	27,184	25,400	25,400	25,400

Present and Projected Water Requirements (1000 acre-feet)

	1970		1980		2000		2020	
	Div	Depl	Div	Depl	Div	Depl	Div	Depl
Total Urban	8.8	3.9	6.3	3.1	15.5	11.6	26.6	20.9
San Juan Co.	8.8	3.9	6.3	3.1	9.7	5.8	19.4	13.7
Export (McKinley)	0	0	0	0	5.8	5.8	7.2	7.2
Rural	2.4	1.1	1.7	1.1	2.0	1.4	2.3	1.7
Manufacturing	.4	.2	.3	.2	.4	.2	1.1	.7
Fish and Wildlife	2.7	1.0	3.1	1.4	14.3	12.6	14.3	12.6
Irrigation*	208.0	79.4	428.3	200.0	759.2	370.0	742.9	370.0
Minerals	5.7	2.2	48.7	43.4	75.7	70.4	80.7	74.5
Military	0	0	0	0	0	0	0	0
Livestock	.5	.5	..5	.5	.7	.7	.9	.9
Reservoir Evap. 1/	23.5	23.5	27.9	27.9	27.9	27.9	27.9	27.9
Stock Pond Evap.	2.3	2.3	2.7	2.7	3.1	3.1	3.1	3.1
Res Evap. -Import	0	0	2.5	2.5	4.1	4.1	4.1	4.1
Power 2/	24.7	16.4	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~
				49.9		71.9		134.8
Requirements								

*Base year flow for irrigation is 1969
1/ Multi-purpose and other such as M&I reservoirs
~~2/ 1970 Diversions and depletions for power are reflected in future time frames~~

NEW MEXICO STATE WATER PLAN
COUNTY DATA
SAN JUAN COUNTY

TABLE 9. - BEA-BBR 1972 LEVEL OF PROJECTIONS:

	1970-Census	1980	2000	2020
Total County Population (18)	52,517	57,900	69,100	82,100
Urban	25,333	32,500	43,700	56,700
Rural	27,184	25,400	25,400	25,400

Present and Projected Water Requirements (1000 acre-feet)

	1970		1980		2000		2020	
	Div	Depl	Div	Depl	Div	Depl	Div	Depl
Total Urban	8.8	3.9	7.3	3.7	15.8	11.6	21.2	17.0
San Juan Co.	8.8	3.9	7.3	3.7	10.3	6.1	14.0	9.8
Export (McKinley)	0	0	0	0	5.5	5.5	7.2	7.2
Rural	2.4	1.1	1.7	1.1	2.0	1.4	2.3	1.7
Manufacturing	.4	.2	.7	.4	1.2	.7	1.8	1.1
Fish and Wildlife	2.7	1.0	3.1	1.4	14.3	12.6	14.3	12.6
Irrigation	208.0	79.4	428.3	200.0	759.2	370.0	742.9	370.0
Minerals	5.7	2.2	48.7	43.4	75.7	70.4	80.7	74.5
Military	0	0	0	0	0	0	0	0
Livestock	.5	.5	.5	.5	.7	.7	.9	.9
Reservoir Evap.1/	23.5	23.5	27.9	27.9	27.9	27.9	27.9	27.9
Stock Pond Evap.	2.3	2.3	2.7	2.7	3.1	3.1	3.1	3.1
Res.-Evap.-Import	0	0	2.5	2.5	4.1	4.1	4.1	4.1
Power	24.7	16.4	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~	~~24.7~~	~~16.4~~
				49.0		71.9		134.8
Requirements								

*Base year flow for irrigation is 1969
1/ Multi-purpose and other such as M&K reservoirs
~~2/ 1970 Diversions and depletions for power are reflected in future time frames~~

ANIMAS-LA PLATA PROJECT

ADVISORY TEAM MEETING

September 26, 1974

ANIMAS - LA PLATA PROJECT
September 26, 1974 Advisory Team Meeting

Alternative Plans

This brochure includes a review of the Durango Diversion Plan which was one of the three plans presented at the August 15, 1974, Advisory Team Meeting. For comparative purposes, a plan is presented which reduces the scale of development such that the power used in pumping is equal to the power generated at Baker's Bridge. This plan, as compared to the full scale development plan, reduces the irrigated full service acreage in Colorado by 16,900 acres. In addition, the 23,500 acre-feet of industrial water for the Ute Mountain Ute Indian Reservation which required pumping was eliminated. All major project facilities are the same for both plans with changes in sizing only. No attempt was made to distribute the irrigation acreage deletions uniformally. The areas furtherest away from the water supply were eliminated. The deletion of power purchases and the resulting cutback in water development lowers the benefit-cost ratio to 1.22 from 1.27 and reduces annual OM&R costs from $1,183,500 to $710,000 per year.

Correction Note

The brochure distributed at the August 15 Advisory Team Meeting contained an error in the OM&R for each of the three plans presented. The OM&R included CRSP depletion charges. Deducting these charges, the correct OM&R values are as follows:

Upper Animas Diversion Plan 1/	$866,000
Ridges Basin Pumping Plan 1/	$1,183,500
Bondad Main Storage Plan 1/	$1,196,800

1/ These plans have been renamed to fit the point of diversion, respectively they are now the Teft Diversion, Durango Diversion, and Bondad Storage & Diversion Plans.

ANIMAS-LA PLATA PROJECT
DURANGO DIVERSION PLAN

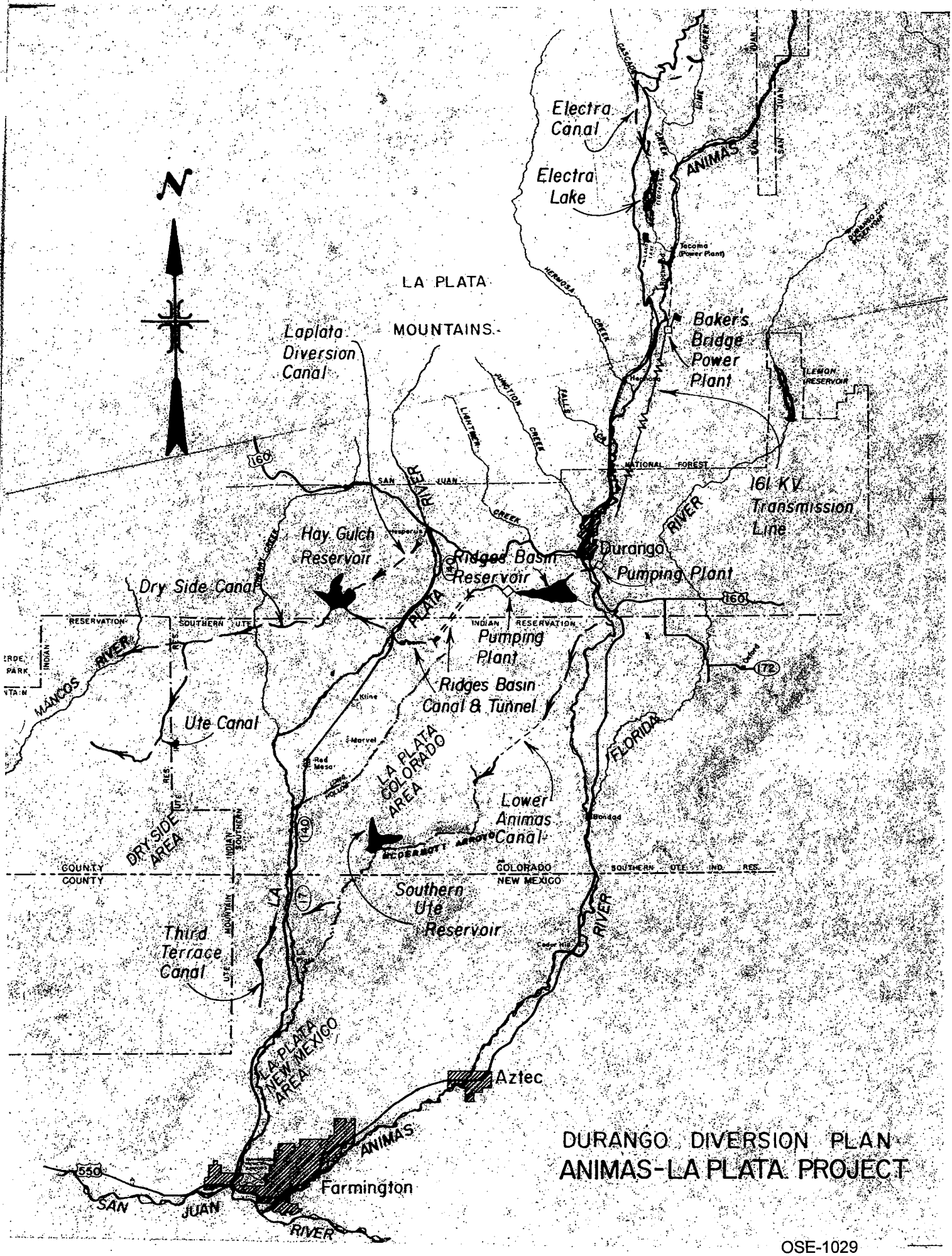
DESCRIPTION

* DURANGO M&I FROM ENLARGED ELECTRA LAKE
* POWER GENERATED AT BAKER'S BRIDGE
* ADDITIONAL POWER PURCHASED FOR FULL SCALE DEVELOPMENT
* PUMP TO RIDGES BASIN RES. FOR CO. IRR. & UTE MTN M&I
* LOWER ANIMAS CANAL FOR SOUTHERN UTE & NEW MEXICO M&I

M&I	ACRE-FEET
DURANGO	30,000
SOUTHERN UTE	55,000
UTE MOUNTAIN	23,500
NEW MEXICO	37,400 c.u.=1900?
TOTAL	145,900

IRRIGATION	ACRES	ACRE-FEET
COLORADO	59,400	121,100
NEW MEXICO	8,050	16,900
TOTAL	67,450	138,000

CONSTRUCTION INVESTMENT	$254,055,000
ANNUAL OM&R	$1,183,500
BENEFIT COST RATIO	1.27:1.0


N
Electra Canal
Electra Lake
ANIMAS
Tacoma (Power Plant)
LA PLATA MOUNTAINS
Laplata Diversion Canal
Baker's Bridge Power Plant
LEMON RESERVOIR
NATIONAL FOREST
161 KV Transmission Line
160
SAN JUAN RIVER
Hay Gulch Reservoir
Ridges Basin Reservoir
Durango Pumping Plant
Dry Side Canal
PLATA
Pumping Plant
Ridges Basin Canal & Tunnel
RESERVATION
SOUTHERN UTE
INDIAN RESERVATION
MANCOS RIVER
Ute Canal
Kline
Marvel
Red Mesa
LA PLATA COLORADO AREA
FLORIDA
Lower Animas Canal
DRY SIDE AREA
COUNTY
COUNTY
COLORADO
NEW MEXICO
SOUTHERN UTE IND. RES.
Southern Ute Reservoir
Third Terrace Canal
LA PLATA RIVER
LA PLATA NEW MEXICO AREA
Aztec
ANIMAS
550
Farmington
SAN JUAN RIVER
DURANGO DIVERSION PLAN
ANIMAS-LA PLATA PROJECT
OSE-1029

ANIMAS-LA PLATA PROJECT
DURANGO DIVERSION PLAN WITH POWER REQUIRED = POWER GENERATED

DESCRIPTION

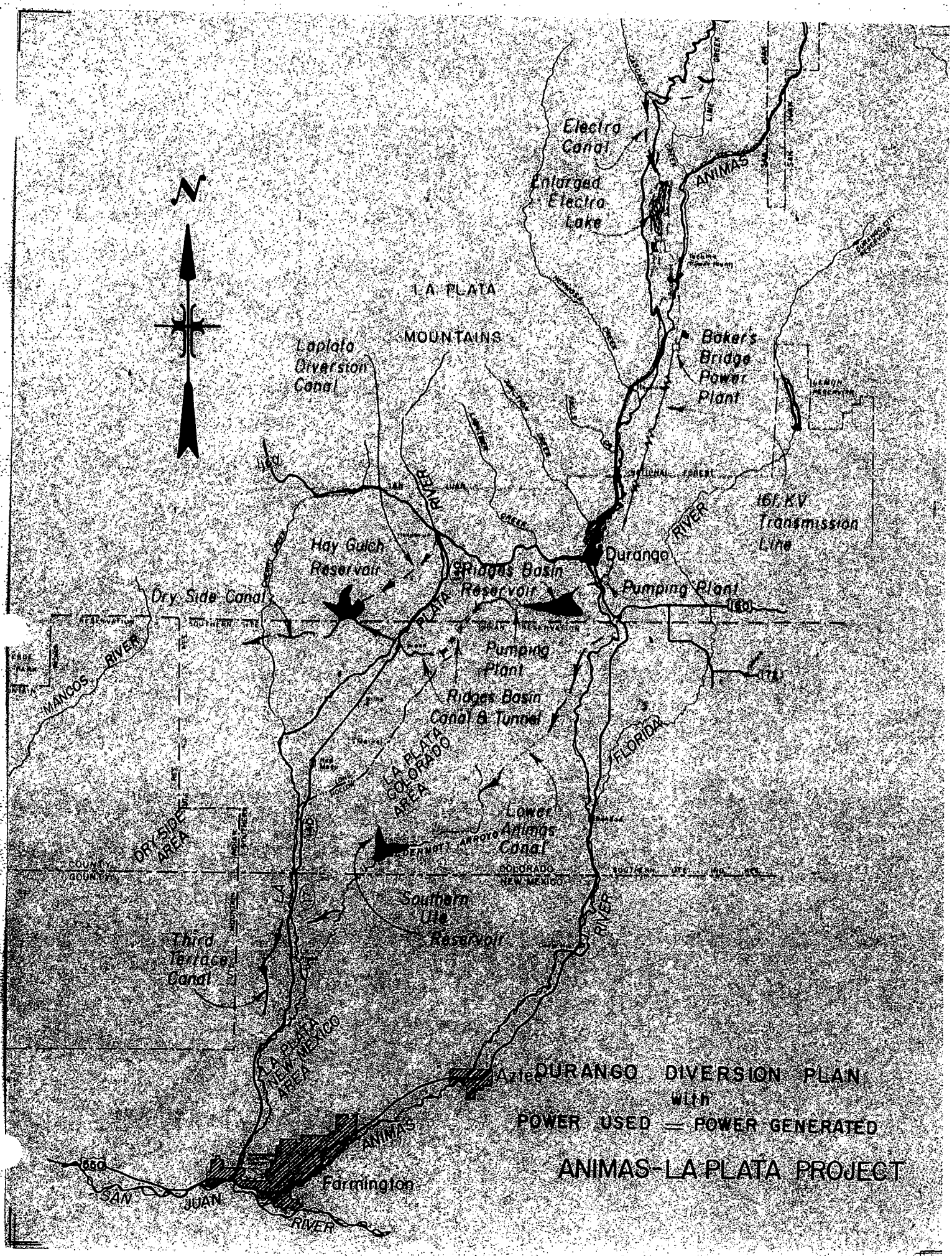
*DURANGO M&I FROM ENLARGED ELECTRA LAKE
*POWER GENERATED AT BAKER'S BRIDGE
*PUMP TO RIDGES BASIN RESERVOIR FOR COLORADO IRRIGATION
*LOWER ANIMAS CANAL FOR SOUTHERN UTE & NEW MEXICO M&I

M&I	ACRE-FEET
DURANGO	30,000
SOUTHERN UTE	55,000
NEW MEXICO	37,400
UTE MOUNTAIN UTE	-
TOTAL	199,700

IRRIGATION	ACRES	ACRE-FEET
COLORADO	42,500	86,700
NEW MEXICO	8,050	16,900
TOTAL	50,390	103,600

CONSTRUCTION INVESTMENT	$204,007,000
ANNUAL OM&R	$710,000
BENEFIT COST RATIO	1.22:1.0

1/ THIS STUDY SHOWS THAT ELIMINATING ALL POWER PURCHASES WOULD REQUIRE REDUCING FULL SERVICE IRRIGATION IN COLORADO BY 16,900 ACRES AND DROPPING THE 23,500 ACRE-FEET OF UTE MOUNTAIN UTE INDIAN M&I WATER.



DURANGO DIVERSION PLAN
with
POWER USED — POWER GENERATED

ANIMAS-LA PLATA PROJECT

OSE-1031

LAS ANIMAS MAINSTREAM DITCHES PRIORITY

			DITCH	PRIORITY	PRIORITY DATE	MAX DIV RATE CFS	ACCUM DIV RATE CFS	ACRES SERVED	TOWN SERVED
				1	2	3	4	5	6
1	1/		LOWER ANIMAS	1A	1877	44.11	44.11	1477	AZTEC
2	2/	3/	STAR	1B	1877	54.97	109.08	1362	FARMINGTO
3	4/		GRAVES	2A	1878	1.68	110.76	55	
4	5/		ELEDGE	2B	1878	25.79	136.55	1032	
5	6/		FARMINGTON-ALLEN	2C	1878	16.25	152.8	650	
6	7/		WILLETT	2D	1878	1.61	154.41	49	
7	8/		WRIGHT-LEGGETT	2E	1878	41.22	195.63	809	FARMINGTO
8			KELLO-BLANCETT	3A	1880	13.15	208.78	526	
9			TERRELL	3B	1880	8.63	217.41	345	
10	9/		AZTEC	4	1882	28.24	245.65	1130	
11			CEDAR	5A	1886	8.52	254.17	341	
12			RALSTON	5B	1886	9.2	263.37	364	
13			STACEY	5C	1886	12.08	275.45	483	
14			TWIN ROCKS	6	1887	8.62	284.07	345	
15			SARGENT	7	1888	4.5	288.57	174	
16	10/		INDEPENDENT	8A	1891	71.96	360.53	1788	FARMINGTO
17			HALFORD	8B	1891	22.28	382.81	891	
18	11/		FARMERS'	9	1892	27.4	410.21	1096	
19			ECHO	10	1896	39.61	449.82	1585	
20	12/		NORTH FARMINGTON	11	1897	57.9	507.72	1188	FARMINGTO
21			ATTEBERRY	12	1901	16.08	523.8	643	
22			AZTEC EXT	13	1903	6.33	530.13	253	
23			JONES EXT of FARMERS'	14	1907	5.26	535.39	210	
24									
25			LOWER ANIMAS EXT	15	1907	16.05	551.44	642	
26			FARMERS MUTUAL	16	1920	104.53	656.97	4182	
27									

ANIMAS-LA PLATA ADVISORY TEAM MEETING

July 11, 1974

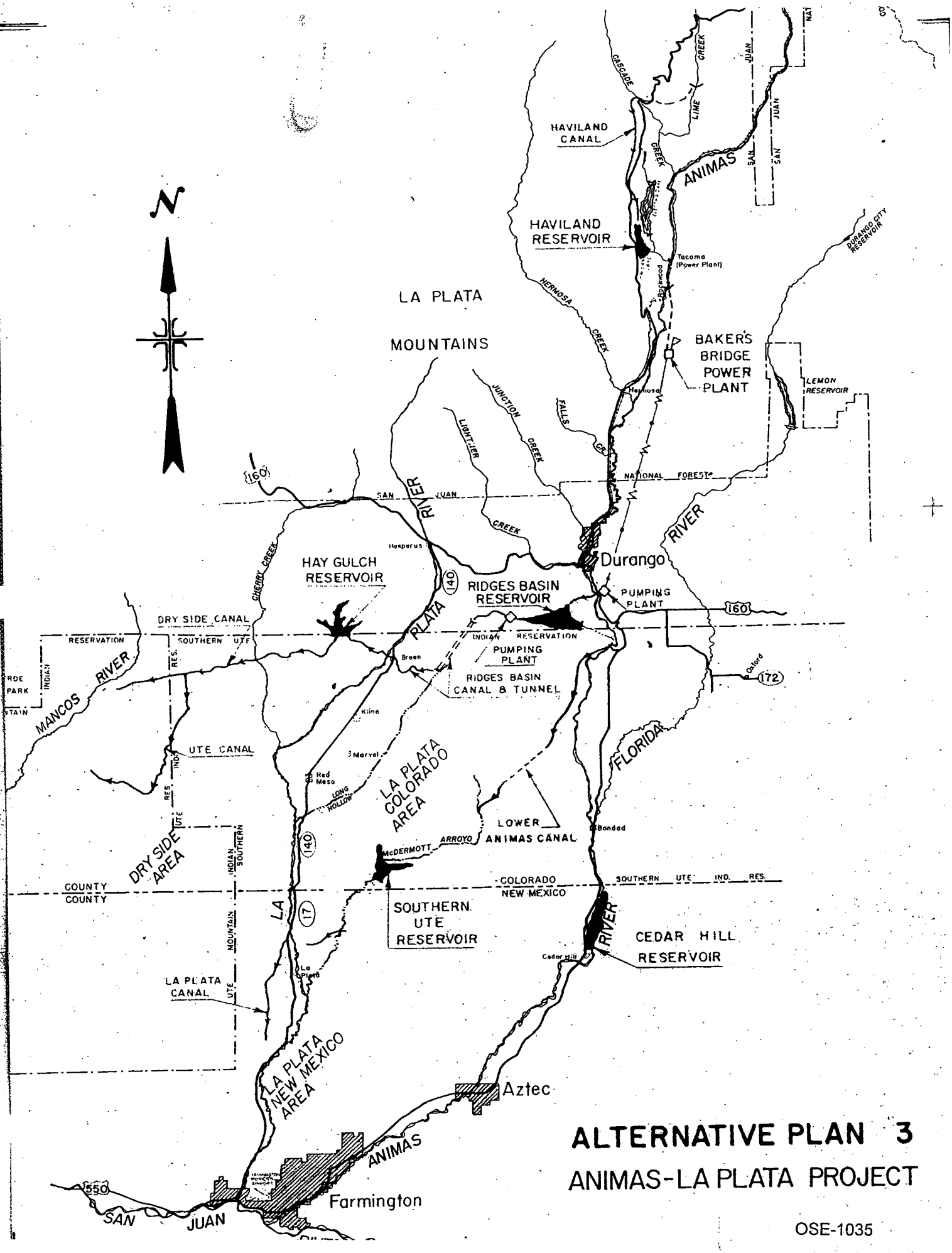
Durango, Colorado

Name	Representing
Frank Sam Maynes	SWCWCD, Durango
Fred Kroeger	SWCWCD Durango
Carroll V. Peterson	San Juan Ecological Society, Durango
Fred N. Denney	City of Bloomfield, N.M.
Robert W. Cassady	City of Bloomfield, N.M.
Philip Mutz	N.M. Interstate Stream Comm. Albuquerque,N.M.
F. F. Montoya	La Plata Conservancy Dist.N.M.,La Plata, N.M.
Elbert Hamblin	La Plata Conservancy Dist.N.M., La Plata,N.M.
Wilson C. Skeet	Navajo Tribe, Window Rock, Ariz
R.J. Scanlon	City of Farmington, Farmington
Babe Billy	Navajo Agric. Product Industry, Farmington
Victor A. Paulek	La Plata Water Conservancy Dist, Hesperus
R. H. Tyner	SW Water Cons. Dist. Durango
Charles H. Hunter	BIA, Southern Ute, Ignacio
Bill Gibbons	Region 9 Planning Comm., Durango
J. H. ~~Keller~~ R. Hart	Animas Reg. Planning Comm, Durango
S. W. Spencer	Sierra Club, Durango
E. K. Wiscombe	USBR, Durango
Wayne Cook	USBR, Durango
Glade Barney	USBR, Durango
Pete Eisele	USBR, Durango
Don Clay	USNR, Durango

ANIMAS-LA PLATA PROJECT

ADVISORY TEAM MEETING

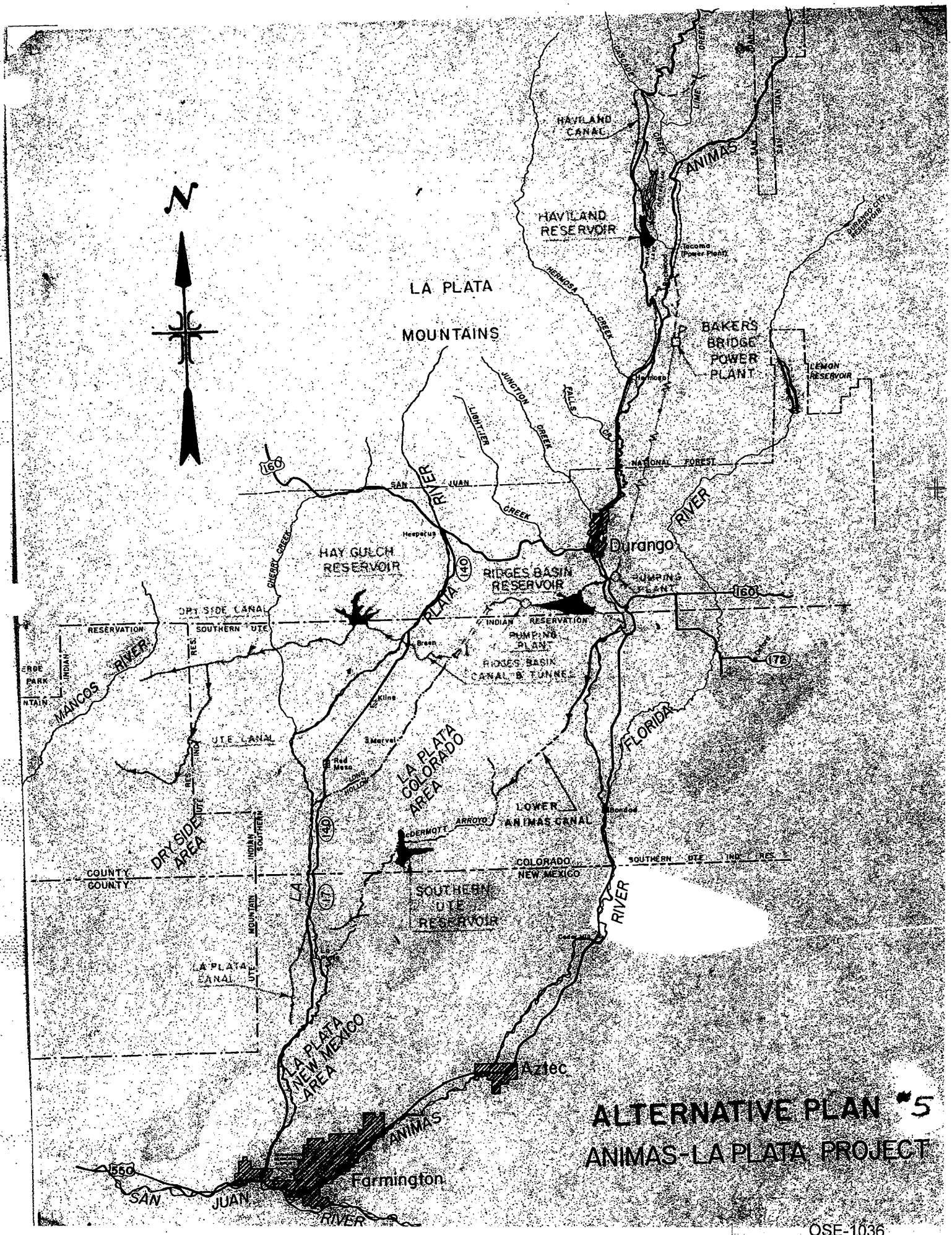
July 11, 1974



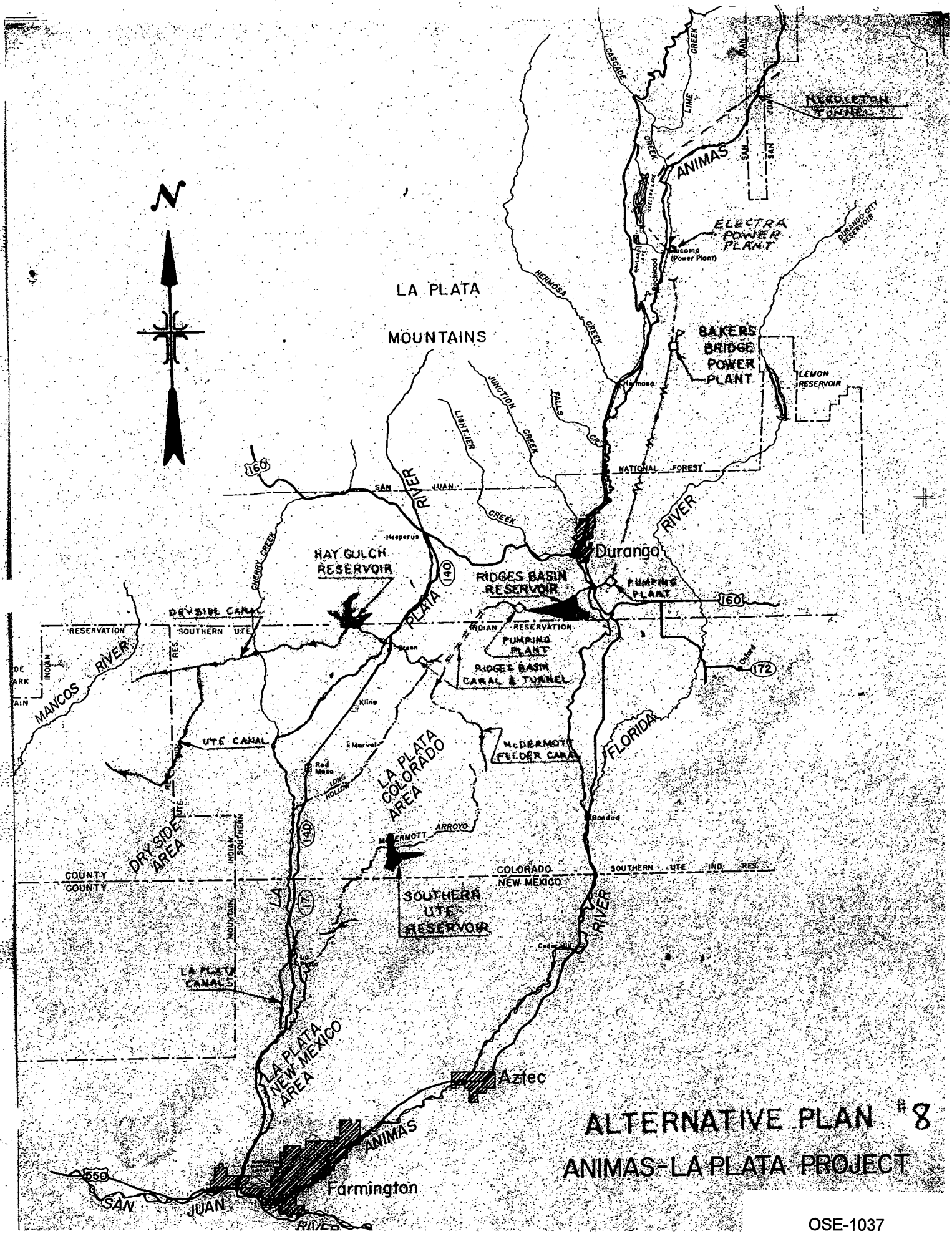
ALTERNATIVE PLAN 3

ANIMAS-LA PLATA PROJECT

OSE-1035


N
HAVILAND CANAL
HAVILAND RESERVOIR
ANIMAS
LA PLATA MOUNTAINS
BAKER'S BRIDGE POWER PLANT
Tacoma (Power Plant)
HERMOSA CREEK
LEMON RESERVOIR
JUNCTION CREEK
LIGHTNER CREEK
FALLS CREEK
NATIONAL FOREST
160
SAN JUAN RIVER
CHERRY CREEK
HAY GULCH RESERVOIR
Hesperus
Durango
RIDGES BASIN RESERVOIR
PUMPING PLANT
DRY SIDE CANAL
INDIAN RESERVATION
SOUTHERN UTE
PUMPING PLANT
RIDGES BASIN CANAL & TUNNEL
Bayfield
MANCOS RIVER
UTE CANAL
Kline
Marvel
Red Mesa
LA PLATA COLORADO AREA
FLORIDA RIVER
LOWER ANIMAS CANAL
Bondad
DRY SIDE AREA
DERMOTT ARROYO
COLORADO NEW MEXICO
SOUTHERN UTE RESERVOIR
LA PLATA RIVER
LA PLATA CANAL
LA PLATA NEW MEXICO AREA
Aztec
ANIMAS
Farmington
550
SAN JUAN RIVER
ALTERNATIVE PLAN #5
ANIMAS-LA PLATA PROJECT

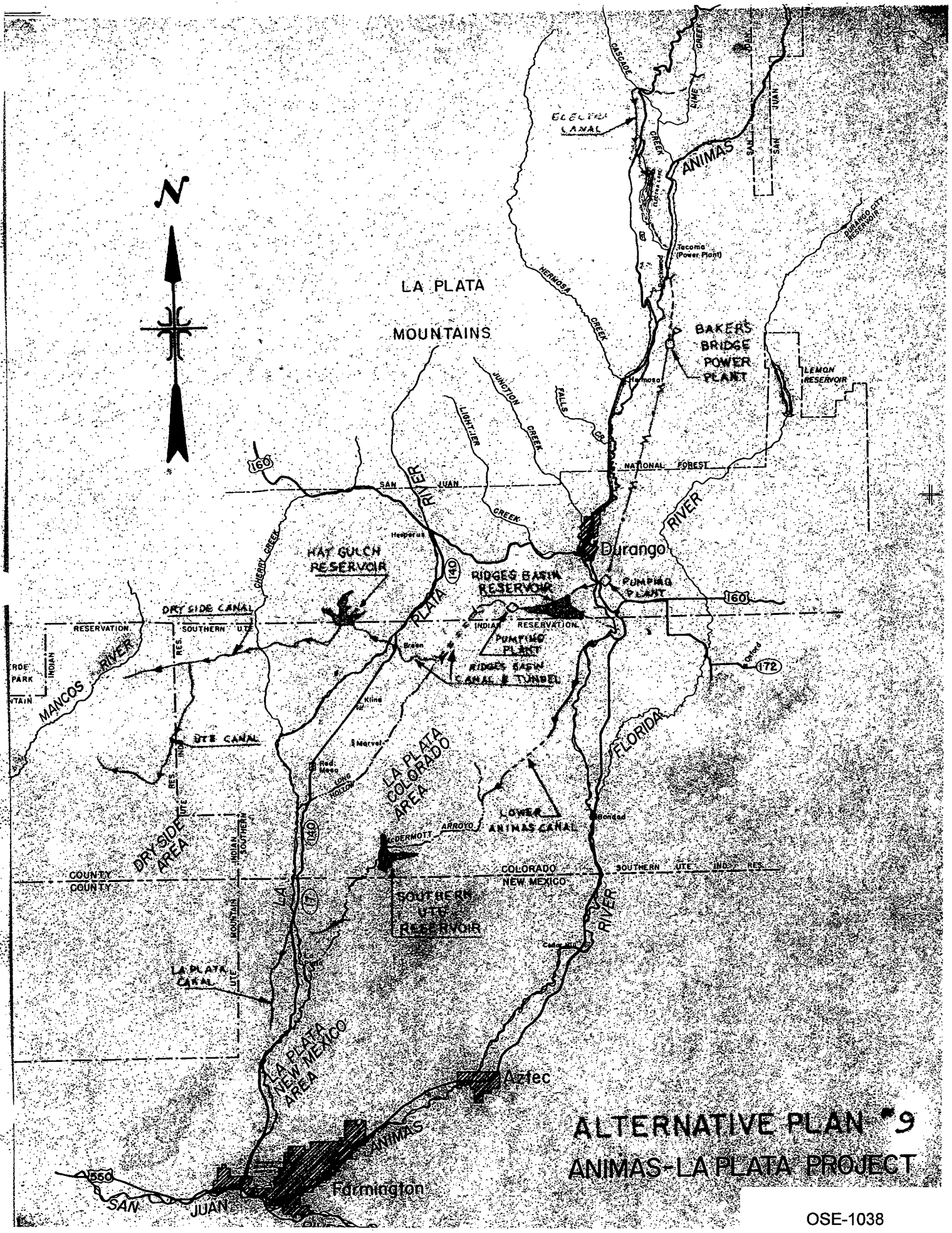
OSE-1036



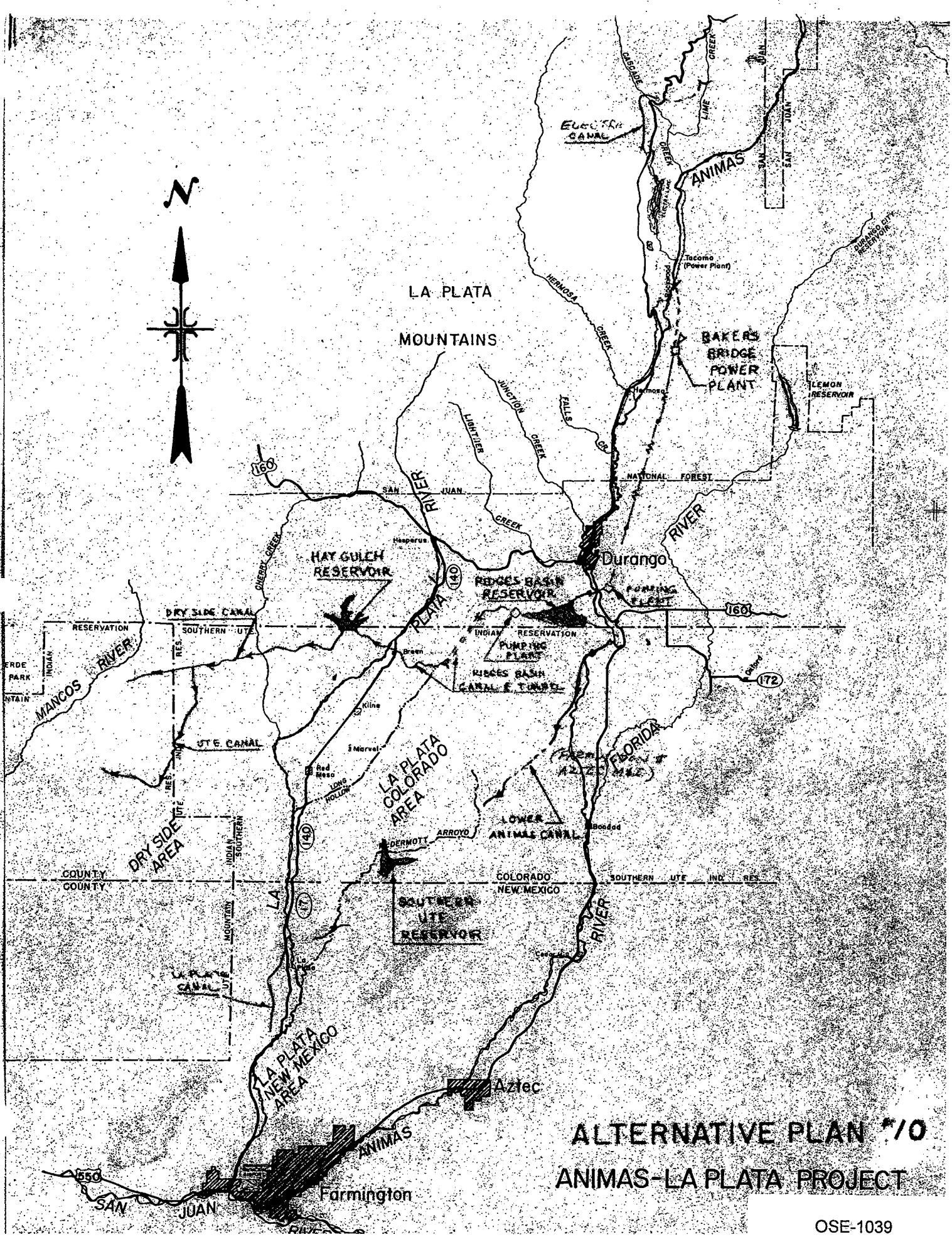
ALTERNATIVE PLAN #8

ANIMAS-LA PLATA PROJECT

OSE-1037


LA PLATA
MOUNTAINS
ANIMAS
Tacoma
(Power Plant)
BAKER'S
BRIDGE
POWER
PLANT
LEMON
RESERVOIR
NATIONAL FOREST
SAN JUAN RIVER
Durango
Hesperus
HAT GULCH
RESERVOIR
RIDGES BASIN
RESERVOIR
PUMPING
PLANT
DRY SIDE CANAL
SOUTHERN UTE
INDIAN RESERVATION
PUMPING
PLANT
RIDGES BASIN
CANAL & TUNNEL
Bayfield
Oxford
MANCOS RIVER
UTE CANAL
Kline
Marvel
Red Mesa
LA PLATA
COLORADO
AREA
FLORIDA
RIVER
McDERMOTT ARROYO
LOWER
ANIMAS CANAL
Bondad
DRY SIDE
AREA
COLORADO
NEW MEXICO
SOUTHERN UTE IND. RES.
SOUTHERN
UTE
RESERVOIR
LA PLATA
CANAL
LA PLATA
NEW MEXICO
AREA
Aztec
ANIMAS
Farmington
SAN JUAN
160
140
172
550
ALTERNATIVE PLAN #9
ANIMAS-LA PLATA PROJECT

OSE-1038



ALTERNATIVE PLAN #10

ANIMAS-LA PLATA PROJECT

OSE-1039

ANIMAS-LA PLATA PROJECT

RESUME OF

ADVISORY TEAM MEETING OF AUGUST 15, 1974
&
PUBLIC MEETING OF SEPTEMBER 12, 1974

Advisory Team Meeting

The eighth meeting of the Animas-La Plata Advisory team was held in the Bureau of Reclamation conference room in Durango on August 15, 1974.

Bureau of Reclamation personnel presented their version of the best plan of each of the three major diversion concepts considered thus far. All three concepts provide for sprinkler irrigation. A description of the plans follow:

Teft Diversion Plan

This plan would provide for gravity diversion at Teft with terminal storage at a small Ridges Basin Reservoir for all municipal uses and at Hay Gulch Reservoir for all other uses. Southern Ute Reservoir would capture excess runoff and irrigation return flows of the La Plata River for industrial use on the Southern Ute Reservation and for irrigation in New Mexico.

Advantages: operation and maintenance costs are lower than those for other plans, thus permitting greater irrigation repayment capability.

Disadvantages: (1) Depletes longest reach of Animas River, and (2) Diversion Canal has adverse environmental impacts.

Durango Diversion Plan

This plan would utilize an enlarged Electra Lake to provide municipal and industrial water for Durango. Power would be generated at the potential Baker's Bridge Powerplant and utilized along with supplemental power purchases from the CRSP to provide power for project pumping. Animas River water would be pumped into Ridges Basin Reservoir just below Durango. The Ridges Basin Pumping Plant and Ridges Basin Canal would convey stored water from the reservoir to the La Plata River drainage, where it would be utilized for irrigation and for resource development on the Ute Mountain Ute Indian Reservation. Hay Gulch Reservoir would provide terminal storage for the Dryside area. The Lower Animas Diversion Canal, would divert below Durango and convey water from the Animas River to the Southern Ute Reservoir for use on the Southern Ute Reservation and for municipal and industrial uses in New Mexico.

Advantages: (1) Animas River undepleted to Durango, and (2) provides unique recreation at Ridges Basin Reservoir (minimum water fluctuation and green belt.)

Disadvantages: (1) Large operation and maintenance cost resulting from power purchase for pumping, and (2) M&I water system at Electra Lake could create public relation problems with Electra Lake Sporting Club.

Bondad Storage & Diversion Plan

This plan would use Electra Lake to provide municipal and

industrial water for Durango. Power would be generated at Baker's Bridge to offset project power requirements, with the balance of power being purchased from the CRSP. All irrigation and municipal and industrial water would be stored at Bondad Reservoir on the Animas River downstream from Durango. Municipal and industrial water for Farmington and Aztec and The Southern Ute Indians would be made available at Bondad Reservoir or could be releaseddirectly into the Animas River. Irrigation water would be pumped and conveyed through tunnels to the La Plata River Drainage. Hay Gulch Reservoir would provide terminal storage for the Dryside area.

Advantages: (1) Leaves Animas River undepleted to Bondad, (2) could enhance fishery downstream from dam and (3) would provide nominal flood control benefits.

Disadvantages: (1) Largest O&M costs of three plans, (2) M&I system at Electra Lake could be a problem, (3) difficult delivery system to lands, (4) Ute Mountain Ute industrial water was excluded, and (5) Southern Ute industrial water was delivered at Bondad Reservoir instead of being pumped to coal mine site.

Public Meeting

The San Juan Ecological Society and the Durango Sierra Club sponsored a public meeting at Fort Lewis College on September 12, 1974. It was conducted in the form of a workshop to assess potential environmental impacts of the Animas-La Plata Project.

Bureau of Reclamation officials spent about 45 minutes briefing the estimated 100 people present on the three planning concepts presented at our August 15 meeting. The group then broke up into 5 randomly selected workshop teams and spent about an hour developing environmental reactions to the plans. Among the comments summarized at a wrap-up meeting were, that:

1. No matter which plan might be adopted, there will be a substantial impact on the area in terms of population growth.
2. Although water might originally be allocated for irrigation, higher valued purposes could divert its use for subdivisions and industry and thus destroy an agricultural economy after it had been developed at great cost. It was pointed out that this is unlikely with a Federal project where water is allocated and reallocated by a Conservancy District with no opportunity for profit as is the case with privately developed water systems. This points up the reason why it is important that our Advisory Team anticipate future needs of the area now so that adjustments in plan and reallocations can be avoided later.
3. The tie-in of the project with land use planning seemed to be weak.
4. It would be desirable to publish "Environmental Impact Statement" data, on an interim basis rather than waiting for the final report to get public exposure.

There seemed to be considerable frustration among those present that it was not possible, in the course of one evening, to fully explain all the complicated aspects of the project so that everyone had a full grasp of the impacts. This emphasizes the need for further public meetings.

The next meeting of the Advisory Team is scheduled for 1:30 P.M., Thursday, September 26, 1974, at the Bureau of Reclamation conference room on the fourth floor of the West Building, 835 Second Avenue, Durango, Colorado.

Bob

R. H. Tyner
Staff Member

RHT:plc

7-11-75

COST COMPARISON TO DELIVER 37,400 ACRE-FEET

	SAN JUAN RIVER	ANIMAS RIVER
• STORAGE REQMT	12,100	13,200
• FACILITIES	COST	COST
DURANGO PUMPING PLANT	$ 554,000	$ 604,000
RIDGES BASIN RESERVOIR	2,060,000	2,247,000
~~INTEREST~~ TOTAL	$ 2,614,000	$ 2,851,000
INTEREST	170,000	185,000
TOTAL	$ 2,784,000	$ 3,036,000
• ANNUAL EQUIVALENT COST	~~94,300~~	
AMORTIZED @ 3¼% @ 100 yrs	$ 94,300	$ 102,900
O&M	7,900	8,600
POWER COST	40,000	29,000
TOTAL	$ 142,200	$ 140,500

• ADDITIONAL COSTS (NEXT PAGE)

7-11-75

	SAN JUAN RIVER		ANIMAS RIVER
ADDITIONAL PUMPING FROM SAN JUAN RIVER		(ROUGH COSTS)	
PUMPING PLANT	2,600 KW	1,100,000	Potential enlargement or rehabilitation of Beclivo Reservoir intake canal
SUBSTATION	3,200 KVA	450,000	
PUMPSTOCK & PIPES	75 CFS	2,000,000	
RIVER INTAKE	75 CFS	750,000	
		→ 4,300,000 1/	

1/ Present worth value would be smaller because facilities could be installed as demands arise.

7-11-75

ANIMAS-LAPLATA PROJECT
NEW MEXICO
REPAYMENT ESTIMATES

IRRIGATION (PAYMENT CAPACITY)

SPRINKLER $7.00 - $9.00 / ACRE FOOT
GRAVITY $5.00 - $7.00 / ACRE FOOT

MUNICIPAL & INDUSTRIAL WATER

CONSTRUCTION	COSTS	$40 - 60 / ACRE-FOOT
OM&R	COSTS	$3 - 5 / ACRE FOOT
TOTAL		$43 - 65 / ACRE-FOOT

7-11-75

ANIMAS-LA PLATA PROJECT
NEW MEXICO
DIVERSION REQUIREMENTS

	TUNNEL DITCH & THIRD TERRACE	LA PLATA FULL SERVICE AREA	LA PLATA SUPPLEMENTAL SERVICE AREA
APRIL	0.04	0.05	0.06
MAY	0.35	0.47	0.49
JUNE	0.63	0.86	0.86
JULY	0.75	1.02	1.01
AUGUST	0.48	0.65	0.63
SEPTEMER	0.22	0.30	0.30
OCTOBER	0.04	0.05	0.05
TOTAL	2.51	3.40	3.40

SEE ATTACHED SHEETS FOR DERIVATIONS

ANIMAS - LA PLATA PROJECT

Diversion Requirements – TUNNEL DITCH AND THIRD TERRACE (FULL SERVICE).

AF/A

CROP %: A(50) P(4) B(22) G(17) C(7)

SPRINKLER

	April	May	June	July	Aug.	Sept.	Oct.	Total Annual
Crop Consumptive Use	.06	.25	.45	.57	.42	.22	.11	2.08
Effective Precipitation	.04	.03	.03	.07	.10	.07	.09	.43
Water to be Supplied by Irrigation:								
per irrigated acre	.02	.22	.42	.50	.32	.15	.02	1.65
per irrigable acre (x.95)	.02	.21	.40	.48	.30	.14	.02	1.57
Farm Irrigation Efficiency (%)	70	70	70	70	70	70	70	70
Farm Loss	.01	.09	.17	.20	.13	.06	.01	.67
Farm Delivery Requirement	.03	.30	.57	.68	.43	.20	.03	2.24
Redivertible Return Flow								
Net Farm Delivery Rqmt.	.03	.30	.57	.68	.43	.20	.03	2.24
Conveyance loss below Reservoir								
Net Diversion Rqmt at Terminal Reservoir								
Conveyance loss above Reservoir	.01	.03	.03	.04	.03	.01	.01	.16
Operational Losses 5%		.02	.03	.03	.02	.01		.11
Net Diversion Rqmt at Animas Ridges Basin	.04	.35	.63	.75	.48	.22	.04	2.51

OSE-1047

3-6 75

ANIMAS - LA PLATA PROJECT

Diversion Requirements - LA PLATA, N.M. (FULL SERVICE)

AF/A

CROP %: A(50) P(4) B(22) G(17) C(7)

GRAVITY

	April	May	June	July	Aug.	Sept.	Oct.	Total Annual
Crop Consumptive Use	.06	.25	.45	.57	.42	.22	.11	2.09
Effective Precipitation	.04	.03	.03	.07	.10	.07	.09	.43
Water to be Supplied by Irrigation:								
per irrigated acre	.02	.22	.42	.50	.32	.15	.02	1.65
per irrigable acre (x.95)	.02	.21	.40	.48	.30	.14	.02	1.57
Farm Irrigation Efficiency (%)	55	55	55	55	55	55	55	55
Farm Loss	.02	.17	.33	.39	.25	.11	.02	1.29
Farm Delivery Requirement	.04	.38	.73	.87	.55	.25	.04	2.86
Redivertible Return Flow								
Net Farm Delivery Rqmt.	.04	.38	.73	.87	.55	.25	.04	2.86
Conveyance loss below Reservoir								
Net Diversion Rqmt at Terminal Reservoir								
Conveyance loss above Reservoir	.01	.06	.08	.09	.06	.03	.01	.34
Operational Losses 7%		.03	.05	.06	.04	.02		.20
Net Diversion Rqmt at River Ridges Basin	.05	.47	.86	1.02	.65	.30	.05	3.40

OSE-1048

ANIMAS - LA PLATA PROJECT

Diversion Requirements – LA PLATA, N.M. (SUPPLEMENTAL SERVICE)

AF/A

CROP %: A(40) P(15) B(20) G(18) C(7)

GRAVITY

	April	May	June	July	Aug.	Sept.	Oct.	Total Annual
Crop Consumptive Use	.07	.26	.45	.56	.41	.27	.11	2.03
Effective Precipitation	.04	.03	.03	.07	.10	.07	.09	.43
Water to be Supplied by Irrigation:								
per irrigated acre	.03	.23	.42	.49	.31	.15	.02	1.65
per irrigable acre (x.95)	.03	.22	.40	.47	.29	.14	.02	1.57
Farm Irrigation Efficiency (%)	55	55	55	55	55	55	55	55
Farm Loss	.02	.18	.33	.39	.24	.11	.07	1.29
Farm Delivery Requirement	.05	.40	.73	.86	.53	.25	.04	2.86
Redivertible Return Flow								
Net Farm Delivery Rqmt.	.05	.40	.73	.86	.53	.25	.04	2.86
Conveyance loss below Reservoir								
Net Diversion Rqmt at Terminal Reservoir								
Conveyance loss above Reservoir	.01	.06	.08	.09	.06	.03	.01	.34
Operational Losses 7%		.03	.05	.06	.04	.02		.20
Net Diversion Rqmt at River ~~Ridges Basin~~	.06	.49	.86	1.01	.63	.30	.05	3.40

OSE-1049

IRRIGATION REPAYMENT STUDIES

Colorado River Storage Participating Projects

The Reclamation Act of 1939 provides that the allocated irrigation costs of a project are repayable without interest from project revenues. The extent of the repayment by the irrigation water users is limited by their ability to pay. The act permits surplus revenues from power, municipal and industrial (M&I) water, or other sources to be applied to the reimbursement of irrigation costs that are excess to the water users' ability to repay.

Under present policy, a farmers' capacity to pay for water is derived from an agricultural economic analyses of typical farm enterprises. Determinations of payment capacity are integrated with land classification studies so as to reflect the productive capacity and repayment ability of the principal classes of project land. Reclamation policy provides that irrigable lands must have sufficient capacity to enable the farmer to meet his production expenses, pay project operation and maintenance charges, provide an adequate living for his family and repay a reasonable portion of project costs. As a minimum, this means that such lands must pay at least the per acre charges for defraying project operation and maintenance expenses; otherwise, those lands are classed as nonirrigable and omitted from the service area. Because of the farmer's limited capability to pay total costs, the irrigation water users' share of the project repayment may represent a small portion of the total where repayment assistance is available from project M&I,

power, or other revenues. Otherwise, the irrigators must repay the entire construction cost.

Not applicable to NSM CRSP Projects

Different methods of determining payment capacity are currently used by the Bureau of Reclamation including, farm budgets, crop enterprise studies, and current market value of water, with farm budget analyses being the most common. Farm budgets encompassing the family-type farm concept for both the "with and without situation" by land classes, incorporating the results of the water supply studies, measure the increase in net farm income attributable to the project. In nearly all instances, we believe, it is necessary to make a farm management survey of the project or adjacent correlation area to obtain basic or primary data relative to size and type of farm, land use, crop yields, and other related information. A farm management survey schedule, prepared by the Bureau of Reclamation, has been developed for this purpose.

A farm unit is appraised from the viewpoint of a family-sized farm operated by a farmer and his family with average managerial ability under average conditions. Such a unit does not represent the highest profit combination or the most efficient organization, farm size, or practices. Neither does it represent the production and farm incomes that could be expected from inexperienced farmers in need of special training and assistance.

Farm budgets are prepared on the basis of machinery and specialized items of equipment as may be necessary on each particular type of farm.

Farm budgets represent a situation on the farm following a reasonable development period which permits the farmer to develop his unit to normal productivity.

Estimates of payment capacity are based on farm costs and returns estimated on current normalized prices. Such a price series consists of a near-term period normalized for unusual conditions and with greater weight given to the most recent years. Agricultural price standards are prepared annually by the Economic Research Service, U.S. Department of Agriculture. These standards are updated annually and are to be used by all Water Resources Council agencies for planning and evaluating water and related land resources projects.

Farm payment capacity is defined as return to water and is the income remaining after the returns to management, equity, and labor have been deducted from the net farm income.

All farm budgets currently being prepared in the Upper Colorado Region use Automatic Data Processing (ADP) to aid in preparation of budget.

The charts on the following pages illustrate how the farm budget is used and how payment capacity is derived.

Gross Farm Income - The gross farm income consists mainly of cash sales of crops, livestock, and livestock products.

Farm Expenses - The farm expenses are made up of general expenses, crop expenses and livestock expenses. The general expenses include most of the fixed costs such as depreciation, repairs, insurance, taxes, utilities, fences, domestic water, etc., as well as such variable costs as hired labor, operating interest, and interest on the debt. The cost of crop and livestock expenses is mostly variable costs which depend on the number of acres of crops planted or the number of breeding cows or other livestock.

Net Farm Income - Net farm income is defined as the gross farm income

less the farm expenses, including interest on the debt. It consists of (1) returns to management, (2) equity, (3) operator's labor, (4) water.

(1) Returns to management - The net farm income is determined partially by the operator's management ability. The farmer decides what crops to grow, what kind of livestock to raise, and what inputs to use. Better management usually results in higher net farm income. An appropriate allowance per hour of operator's labor is used as a return to management

(2) Return to equity - An appropriate long-term interest rate is computed on the farm investment. About 80 percent of this charge is considered a farm expense. The remaining 20 percent is considered a return to the farmer's equity and will allow the farmer to retire his mortgage during his active farm life.

(3) Return to operator's labor - The development of irrigation is premised on farms of sufficient size to support a farm family and provide essentially full employment for the operator. A value or wage rate per operator hour is used as a measure of return to farmer labor.

(4) Payment capacity - Payment capacity or return to water is the income remaining after the returns to management, equity, and labor have been deducted from net farm income. Payment capacity or the farmer's ability to pay water costs is divided into two components (1) annual operation and maintenance costs and (2) amortization capacity or that amount applied to recovery of capital costs. (See diagram)

One of the current agricultural economic studies is for the Animas-La Plata Project. This project is located in the southwest part of Colorado, encompassing lands near Red Mesa, Colorado, and La Plata, New Mexico. Payment capacity values will be determined by the farm budget method, with a different set of budgets representing each type of farm and class of land. These budgets will be weighted by land class and crop rotation and then expanded to a project total based on increased irrigation water attributed to construction of the project.

The primary data adopted for use in this study were obtained from a farm management survey of the project area conducted by the Bureau of Reclamation during the fall of 1972. Information compiled on farm schedules was obtained from 41 farmers, of which, all were considered full-time operating units. In addition to the primary data obtained, secondary information was available and collected from local, State and Federal entities.

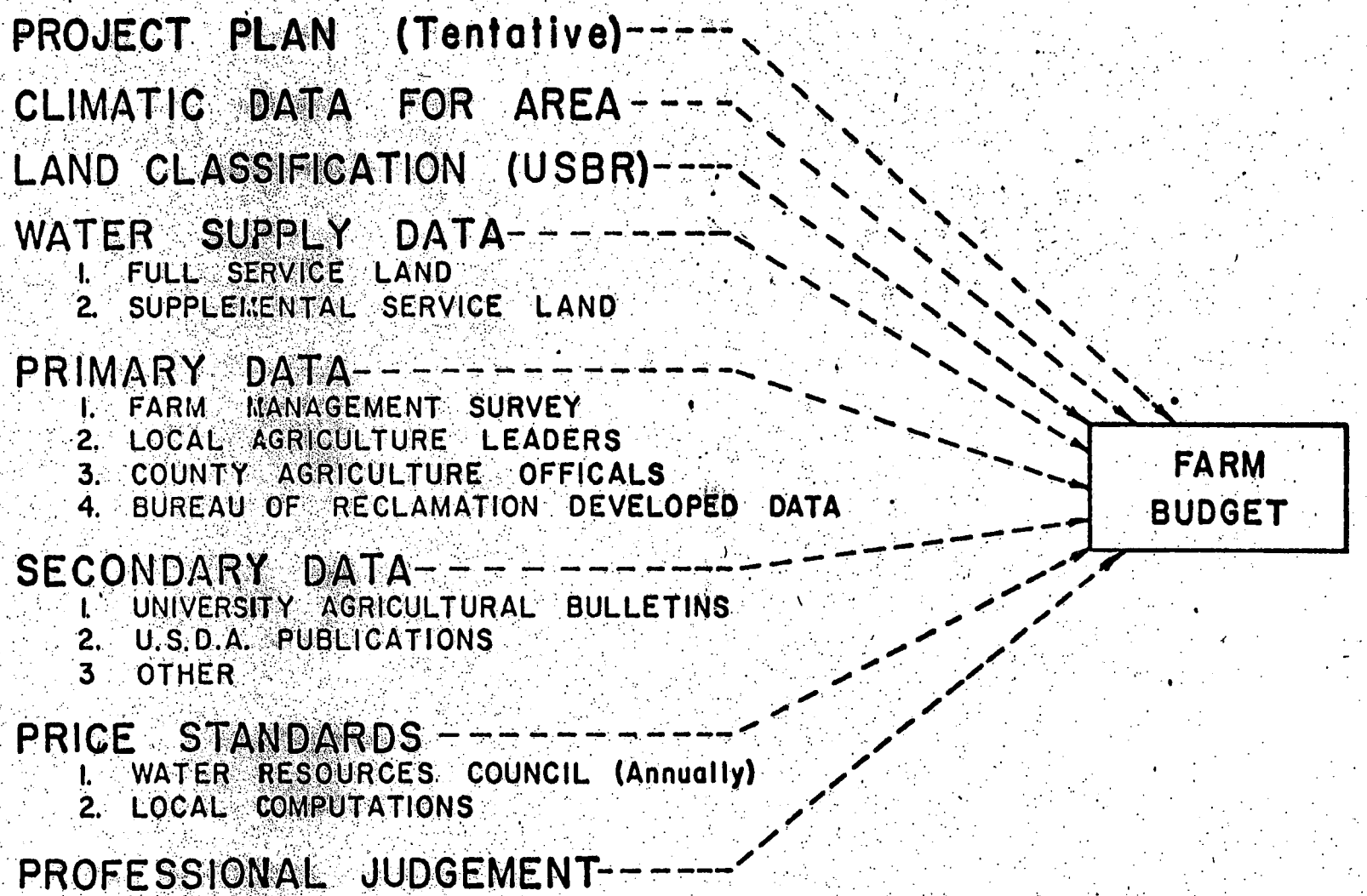
In the planning process, the ability of irrigators to pay for water is estimated officially at least two times. The first time is the authorizing document known as the "Feasibility Report." The second estimate is made prior to construction and the details are found in a preconstruction report we call a "Definite Plan Report." (DPR) When an undue length of time elapses after the DPR has been completed, and the project is funded by Congress, or when a significant change is made in the project plan, an official revision of payment capacity is also made and attached as an addendum or supplement to the DPR. The payment capacity studies of new projects are, of course, based on agricultural conditions current at the time, including crop yields, farm prices, costs

of production, etc. Over time, this has resulted in increasing the estimates of payment capacity primarily due to changes in farm prices and technology.

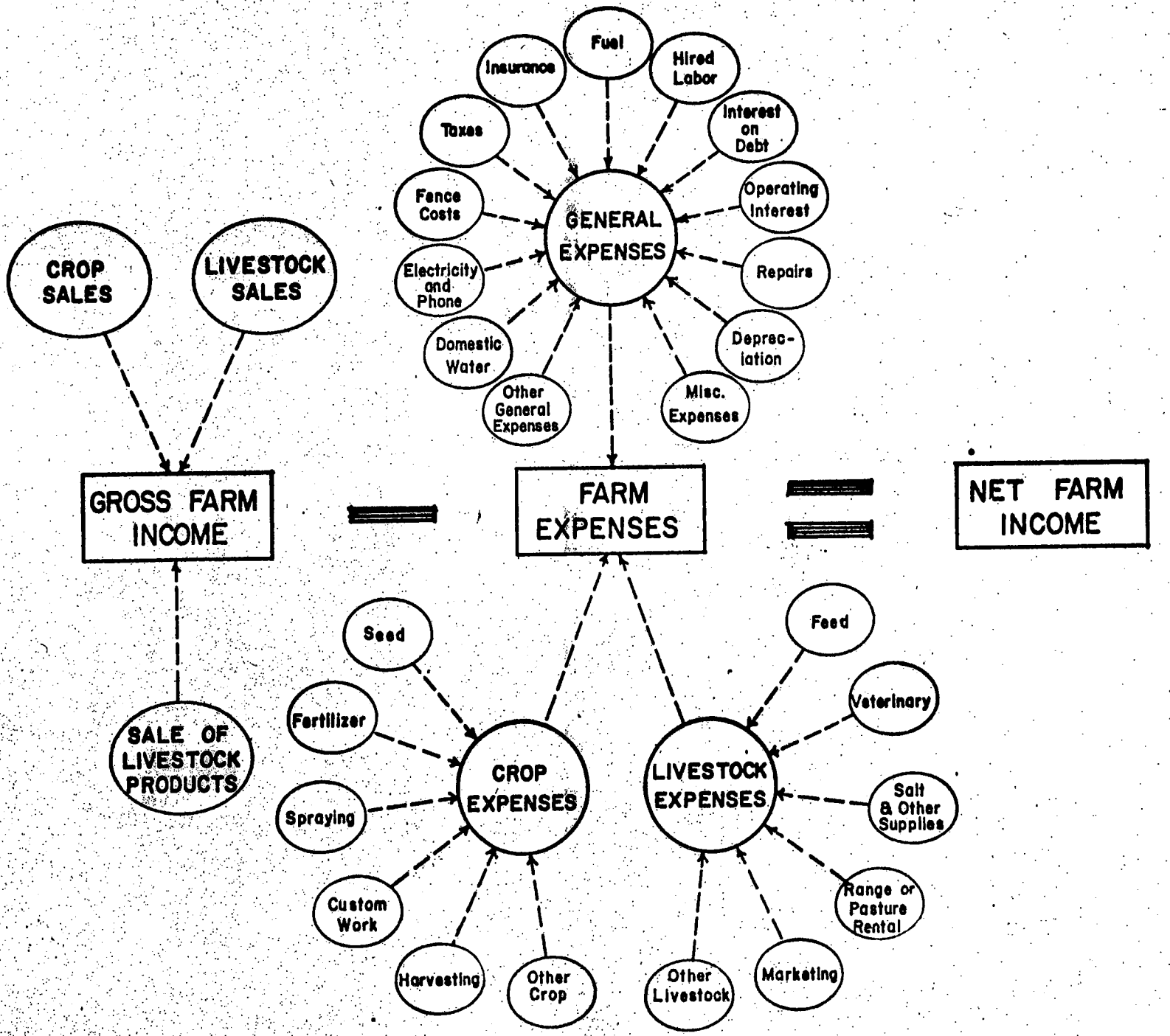
The Bureau of Reclamation, prior to initiation of construction, and after discussions and negotiations with appropriate water user agencies, generally, a water conservancy district executes a repayment contract. The repayment contract provides for a number of things including, (1) who will manage the project and pay costs of operation, maintenance, and replacement (OM&R), and (2) the magnitude of the repayment obligation either under a fixed obligation or water service contract. Since the repayment contract obligates the water user to pay the operation, maintenance, and replacement costs; this amount is automatically subject to increase over time as a function of inflation or other reasons.

Operation, maintenance, and replacement costs of participating projects constructed and in service fluctuates from year to year; but are generally upward. The costs of irrigation water from operating projects has increased largely due to increase in operation, maintenance, and replacement costs.

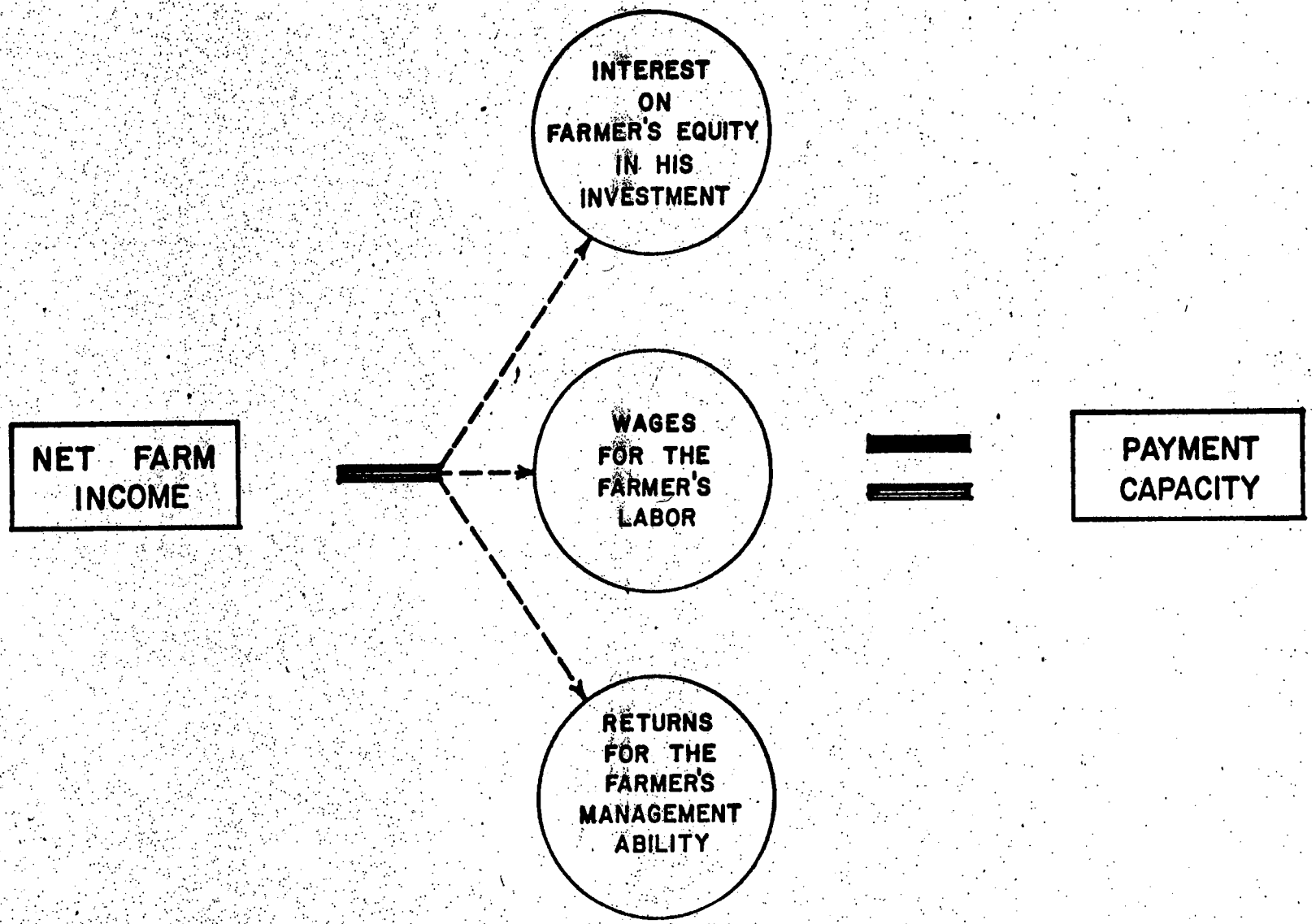
The Secretary of the Interior has discretion to adjust payments involving capital costs when covered by a water service contract. General guidelines provide that future irrigation water service contract rates will include a provision to reflect changes in the irrigator's ability to pay. It should be recognized that, although the general trend will be upward; in some cases, the adjustment may result in reduction of water service rates. The other component of payment capacity, OM&R costs, already fluctuates to cover the actual costs.


PROJECT PLAN (Tentative)
CLIMATIC DATA FOR AREA
LAND CLASSIFICATION (USBR)
WATER SUPPLY DATA
1. FULL SERVICE LAND
2. SUPPLEMENTAL SERVICE LAND
PRIMARY DATA
1. FARM MANAGEMENT SURVEY
2. LOCAL AGRICULTURE LEADERS
3. COUNTY AGRICULTURE OFFICALS
4. BUREAU OF RECLAMATION DEVELOPED DATA
SECONDARY DATA
1. UNIVERSITY AGRICULTURAL BULLETINS
2. U.S.D.A. PUBLICATIONS
3 OTHER
PRICE STANDARDS
1. WATER RESOURCES COUNCIL (Annually)
2. LOCAL COMPUTATIONS
PROFESSIONAL JUDGEMENT
FARM BUDGET

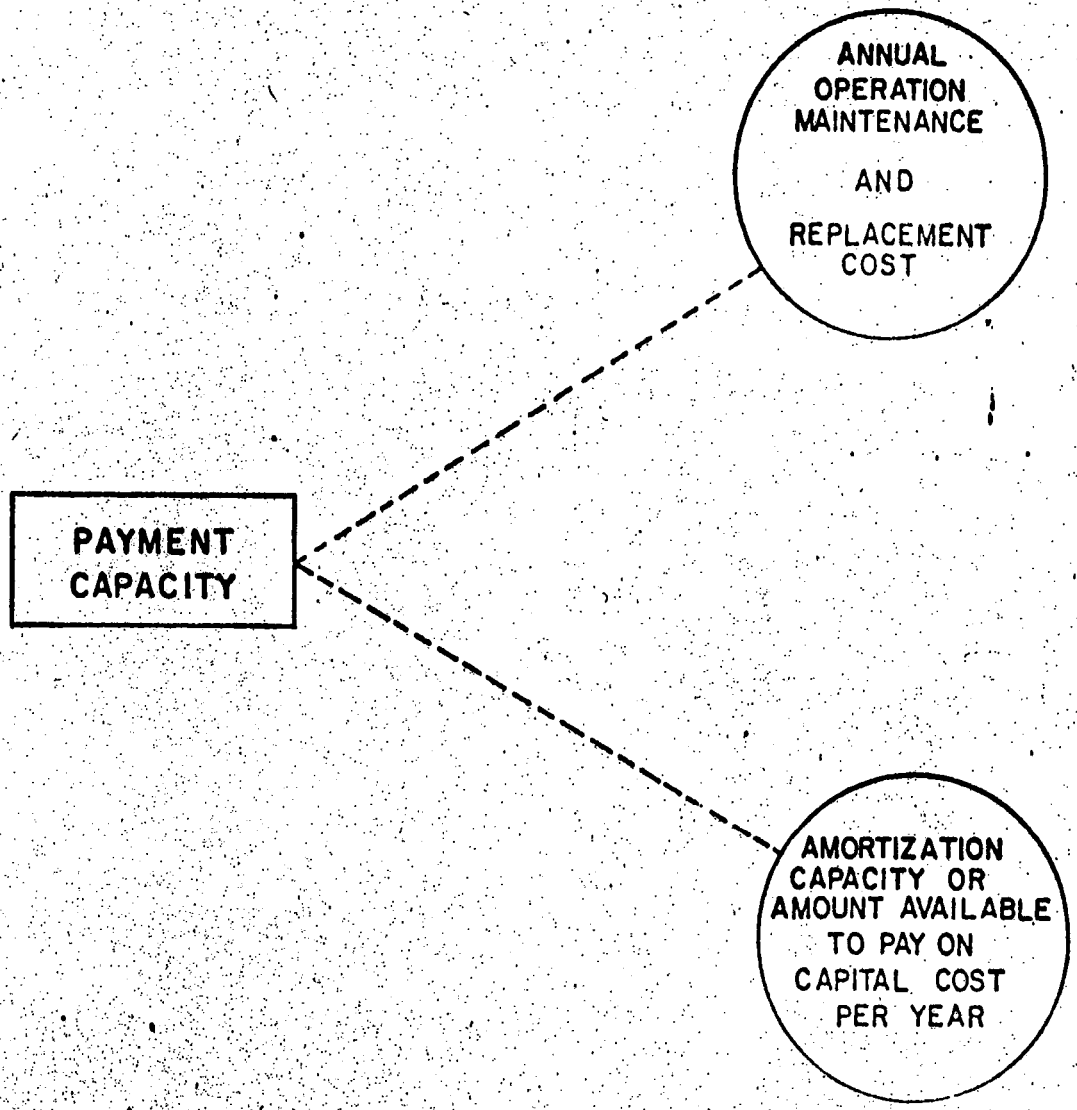
OSE-1056


CROP SALES
LIVESTOCK SALES
GROSS FARM INCOME
SALE OF LIVESTOCK PRODUCTS
Fuel
Insurance
Hired Labor
Taxes
Interest on Debt
Fence Costs
Operating Interest
GENERAL EXPENSES
Electricity and Phone
Repairs
Domestic Water
Depreciation
Other General Expenses
Misc. Expenses
FARM EXPENSES
NET FARM INCOME
Seed
Fertilizer
Spraying
Custom Work
Harvesting
Other Crop
CROP EXPENSES
Feed
Veterinary
Salt & Other Supplies
LIVESTOCK EXPENSES
Range or Pasture Rental
Other Livestock
Marketing

OSE-1057


INTEREST ON FARMER'S EQUITY IN HIS INVESTMENT
NET FARM INCOME
WAGES FOR THE FARMER'S LABOR
PAYMENT CAPACITY
RETURNS FOR THE FARMER'S MANAGEMENT ABILITY

OSE-1058


ANNUAL OPERATION MAINTENANCE AND REPLACEMENT COST
PAYMENT CAPACITY
AMORTIZATION CAPACITY OR AMOUNT AVAILABLE TO PAY ON CAPITAL COST PER YEAR

OSE-1059

ANIMAS-LA PLATA (NEW MEXICO)

PRESENT AND PROJECTED YIELDS OF IRRIGATION REPAYMENT ANALYSIS WITH NORMALIZED PRICES

CROP	UNIT OF YIELD	CURRENT NORMALIZED PRICE	FARM SURVEY YIELDS 1/	YIELDS ON PROJECT LANDS	
				PROJECT W/O IRRIG. REPAYMENT CLASS 2	PROJECT WITH IRRIG. REPAYMENT CLASS 2
ALFALFA HAY	TON	45.43 H	3.8	4.0 ?	5.3
WHEAT	BU	3.00	32.0	35.0	70.0 ?
BARLEY (FEED)	BU	2.36	62.0 50.0	65.0 50.0	80.0 ?
OATS	BU	1.37	62.0 50.0	65.0 50.0	80.0 ?
ROTATION PASTURE	AUM	-	2/	5.0	10.0 ?
CORN SILAGE	TON	15.10 H	14.0	15.0	21.0
CORN GRAIN	BU	2.29 H	-	-	130.0 ?
BEANS	CWT	21.17 H	-	-	18.0 ? 8.0
CROP RESIDUES ALFALFA, GRAINS	AUM	-	1.0	1.0	1.0
STRAW	TON	32.10	.75	.75	1.0
PERMANENT PASTURE	AUM	-	3.0	3.0	3.0 Rangeland

1/ YIELDS WERE BASED ON FARM MANAGEMENT SURVEY OF PRESENTLY IRRIGATED LAND. SURVEY WAS CONDUCTED DURING OCTOBER-NOVEMBER 1972.

2/ INSUFFICIENT DATA TO ESTABLISH PRESENT YIELDS.

TURNOFF RATES PER 100 ANIMAL UNITS, WEIGHTS, PRICES AND VALUES

	TURNOFF RATES REPAYMENT (PERCENT)	TURNOFF RATES BENEFIT (PERCENT)	AVERAGE WEIGHT (LBS)	CURRENT NORMALIZED PRICES ($/CWT.)	INVENTORY VALUE ($/HEAD)
BEEF COW-CALF					
BREEDING COWS (CULL)	8	8	1,000	27.40	200
REPLACEMENT HEIFERS, 18 MO.	14	14			200
REPLACEMENT HEIFERS, 18 MO. (CULL)	4	5	800	39.30	
REPLACEMENT HEIFERS, 8 MO.	15	15	500		150
MARKET CALVES					
STEERS - REPAYMENT	46		440	47.40	
- BENEFIT		48	460	47.40	
HEIFERS - REPAYMENT	31		420	42.00	
- BENEFIT		33	440	42.00	
BULLS	4	4	1,600		400

CROP ACREAGES, PRICES, ROTATIONS AND LIVESTOCK NUMBERS, LA PLATA, NM

		WITHOUT PROJECT		WITH PROJECT				
				SUPPLEMENTAL LANDS		FULL SERVICE LANDS		
						CASH CROPS		
CROPS AND LIVSTOCK	UNIT OF YIELD	YIELD	BEEF COW-CALF	YIELD	BEEF COW-CALF	ROTATION 1	ROTATION 2	ROTATION 3
ALFALFA HAY	TON	4.0	94	5.3	138	115	130	130
WHEAT 1/	BU	35.0	24	70.0	25	42	26	42
ROTATION PASTURE	AUM	5.0	24	10.0	12	-	-	-
CORN SILAGE	TON	15.0	10	21.0	10	-	-	-
CORN GRAIN	BU	-	-	130.0	43	21	43	27
BEANS	CWT	-	-	18.0	-	21	-	-
CROP RESIDUE 2/	AUM	1.0	129	1.0	216	-	-	-
STRAW 2/	TON	.75	24	1.0	25	-	-	-
FARMSTEAD			8		12	11	11	11
TOT. IRRIG. AC.			160		240	210	210	210
PERMANENT PASTURE	AUM		260		260	-	-	-
BEEF COWS			135		135	-	-	-

1/ REPRESENTS ALL SMALL GRAINS
2/ NOT INCLUDED IN IRRIGATED ACRES