

4902-P3 Irrigation Project Case File

TR REHABILITATION & BETTERMENT, ZUNI
IRRIGATION AREAS - FY 1964-68

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Form 5-162b
Oct 1963

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
Branch of Land Operations

*See B
CL*

Report 55-17

PROJECT DATA - Rehabilitation and Betterment Fiscal Year 19 68

NAME OF PROJECT Zuni		LOCATION Zuni Reservation	AREA Gallup
AUTHORIZATION		SOURCE OF WATER SUPPLY Zuni River Pescado and Nutria Creeks - Springs at Ojo Caliente	
DATE CONSTRUCTION STARTED		DEFINITE PLAN REPORT Complete June 30, 1966	

SUMMARY OF DEVELOPMENT		SUMMARIZED FINANCIAL DATA	
Ultimate Irrigable Area (Acres)	<u>4,727</u>	Construction Cost to June <u>30, 19 66</u>	\$ <u>Not-known</u>
Acres Developed to June 30, 19 <u>66</u>	<u>None</u>	Construction Cost Paid up to	
Acres - Non-Indian	<u>0</u>	June <u>30, 19 66</u>	\$ <u>None</u>
Percent Project Acreage Completed		Total Rehabilitation & Betterment	
to June 30, 19 <u>66</u>	<u>None</u>	Program for Current Year	\$ <u>0</u>
Estimated Acreage Served From Rehabilitation & Betterment	<u>4,727</u>	Allotment Requested for Budget Year	\$ <u>200,000</u>
		Rehabilitation & Betterment to Complete	\$ <u>Not-known</u>

PRINCIPAL FEATURES

Features	Size or Capacity	Completion	
		Percent 6-30-19 <u>66</u>	Date
1. Silt diversion dam and feeder canal Pescado Reservoir			
2. Engineering plans and specifications			
3. Water gathering system Ojo Caliente Reservoir			

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Work programmed to be completed F. Y. 1966: The Rehabilitation and Betterment Report will be submitted to Washington for review and approval. The irrigation flume across the Ojo Caliente Wash will be completed.

Work proposed for F. Y. 1967: Finalize the Rehabilitation and Betterment Report after approval is received from Washington. No additional funds are requested to complete the report.

JUSTIFICATION

The Rehabilitation and Betterment Report for Zuni Irrigation areas will be complete June 30, 1966. The report is far enough along that certain works are definitely known to be feasible in the proposed rehabilitation program. These initial feasible project works proposed for construction in Fiscal Year 1968 will require an appropriation of \$200,000. At the present time, the Zuni area is made up of parcels of land in varying sizes up to 10 acres. These are subsistence garden tracts. The Zuni people have an average family income of about \$1,762 per year, (1962 OEDP) and the irrigation areas provide the landowners with a much needed means of supplementing their livelihood. At the present time there are approximately 350 families using irrigated areas to supplement their livelihood. There is an average of approximately 2,000 irrigated acres each year (depending on the amount of water available) that produce crops with an estimated value of \$110,000 per year. The requested Fiscal Year 1968 funds for rehabilitation and betterment of the Zuni areas would provide an additional 900 to 1,000 acre feet of water to the Zuni people which is equivalent to 300 to 350 more irrigated acres of farm land. The work programmed for Fiscal Year 1968 is primarily for the purpose of increasing the amount of stored water to be used for irrigation purposes and reducing the amount of water currently being lost to evaporation and inadequate diversion structures. In years past there appeared to be adequate water for the needs of the Zuni people. Recently, water shortages caused by siltation and low storage capacity of reservoirs, low water years and poor conservation of upstream water have become commonplace and a remedial work is fast becoming a necessity. If the continued loss of this water from reservation lands is allowed to continue the water rights of the Zuni may well be jeopardized. Also, the proposed work would temporarily employ fifteen additional Zuni people for approximately eight months. The funds requested for Fiscal Year 1968 would be used for a silt detention-diversion dam, gathering basin, feeder canal, pipes, concrete, plans, investigation and specifications, drilling and site testing. The funds would be used on the principal features of the project in priority order as they are listed below:

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Bureau of Indian Affairs

Activity: Irrigation Construction
 Agency: Zuni

Exhibit P-20 Page 1 of 2
 1968 Preliminary Estimate

Project: Zuni

	Program 1967	Preliminary Estimates 1968	Increase (+) or Decrease (-)
1. Area Office Administration and Supervision			
2. Construction.....			
3. Rehabilitation and Betterment.....	0	200,000	
4. Surveys, investigations and studies.....			
TOTAL ESTIMATE.....	0	200,000	+200,000

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Work Proposed for Fiscal Year 1968

1. Pescado Reservoir: Estimated cost \$83,000. Silt detention-diversion dam and feeder canal. The Pescado Reservoir has two main drainage areas, one flows directly into the reservoir and the other must be diverted into it by a diversion dam and feeder canal. At the present time there is a small dam and canal but it is much too small for the runoff that comes in larger volumes. The proposed silt detention-diversion dam would have a silt capacity to hold the estimated silt load of 50 years. It would help to provide an additional estimated 600 acre feet of stored water for irrigated farming at Pescado. It will also prolong the life of the existing reservoir by measurably reducing current siltation problems.
2. Ojo Caliente Reservoir: Estimated cost \$87,000. The Ojo Caliente Reservoir is fed mostly by springs. About 50% of the water is lost to waterloving plants and seepage before it reaches the reservoir. It is proposed to collect the water in four 1000 cubic yard basins. From these gathering basins the water will be piped to the reservoir through 4,200 feet of 10-inch and 6,600 feet of 15-inch pipe. This will provide an estimated 300 to 400 acres feet of additional water for the Zuni people at Ojo Caliente.
3. Nutria #2 and Ojo Caliente Reservoirs: Estimated cost \$30,000. This will include the investigation, engineering, plans, drafting specifications and drilling site testing cores necessary for the enlarging of the two reservoirs.

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FUNDS REQUESTED
for future rehabilitation work

F.Y. 1969	200,000
F.Y. 1970	200,000
F.Y. 1971	200,000

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Zuni Irrigation Project

Summary of Reservoir Storage Capacity

Unit	Source of Water	Reservoir	Original Storage Constructed		Measured and estimated Capacity		
			Date	Capacity Acre-feet	Present Acre-feet	Proposed Acre-feet	Available to Unit acre-feet
Nutria	Upper Nutria River	Nutria Diversion	1932	over nite	61±	20	20
Pescado	Springs and flood water + diversions from Pescado Creek	Pescado	1931	400	710	3000	1000 ✓
Zuni Unit	Zuni River and tributaries including Nutria Creek Pescado Creek	Blackrock Nutria #2 Nutria #3 Nutria #4 Pescado	1909 ✓ 1932 1934 1938	14,817 ✓ 3,062 1,500 880	2,600 ✓ 2,560 700 800	2,600 16,700 700 800 3000	2,600 16,700 Silt only Fish only 1,000
Tekapo	Zuni River + Tributaries	Tekapo	1937	400	200±	200±	200±
Ojo Caliente	Ojo Caliente Springs Ojo Caliente	Ojo Caliente Ojo Caliente Detention	1937	273	325	325 10,000	325 500

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Land Agency

Branch of Land Operations Trip Report

Date or Dates of Trip: March 5, 1964

Location or Locations Visited: Gallup Area Office - Irrigation Section

(A) BUREAU:

Area Irrigation Personnel.

(B) NON-BUREAU:

None

Results of Trip:

(A) HIGHLIGHTS NOTED:

Discussed rehabilitation of Zuni Pescado and Ojo Caliente Units. Still lack Nutria Unit.

(B) PROBLEMS ENCOUNTERED:

Costs per Unit run from \$1,000 to \$1250 per acre. This might be too high but possibly the Tribe by agreeing to contribute labor on placing drops, turnouts, etc., that they can do.

(C) ACCOMPLISHMENTS:

We went through preliminary figures item by item.

Follow-up Needed:

This must be brought before the Council and find out if they agree with us on this and will need or at least it would be beneficial if the Tribe supported this with a resolution or document.

Other Observations (Use Reverse of Sheet if Needed)

Reported by: James D. Cornett

James D. Cornett, Land Operations Officer

(Sgd) Richard D. Butts

Reviewed by: Richard D. Butts

Richard D. Butts, Superintendent

3/6/64

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Available Water
Irrigated land

Unit	Acres
Nutricu	200
Pescado	350
Zuni	1000
Jekapo	<hr/>
Ogo Caliente	400
	<hr/>
	1950

OFFICIAL ESTIMATE

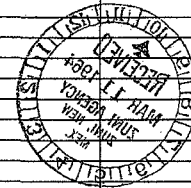
Project *Zuni New Mexico*

Date of Estimate *Mar. 1964*

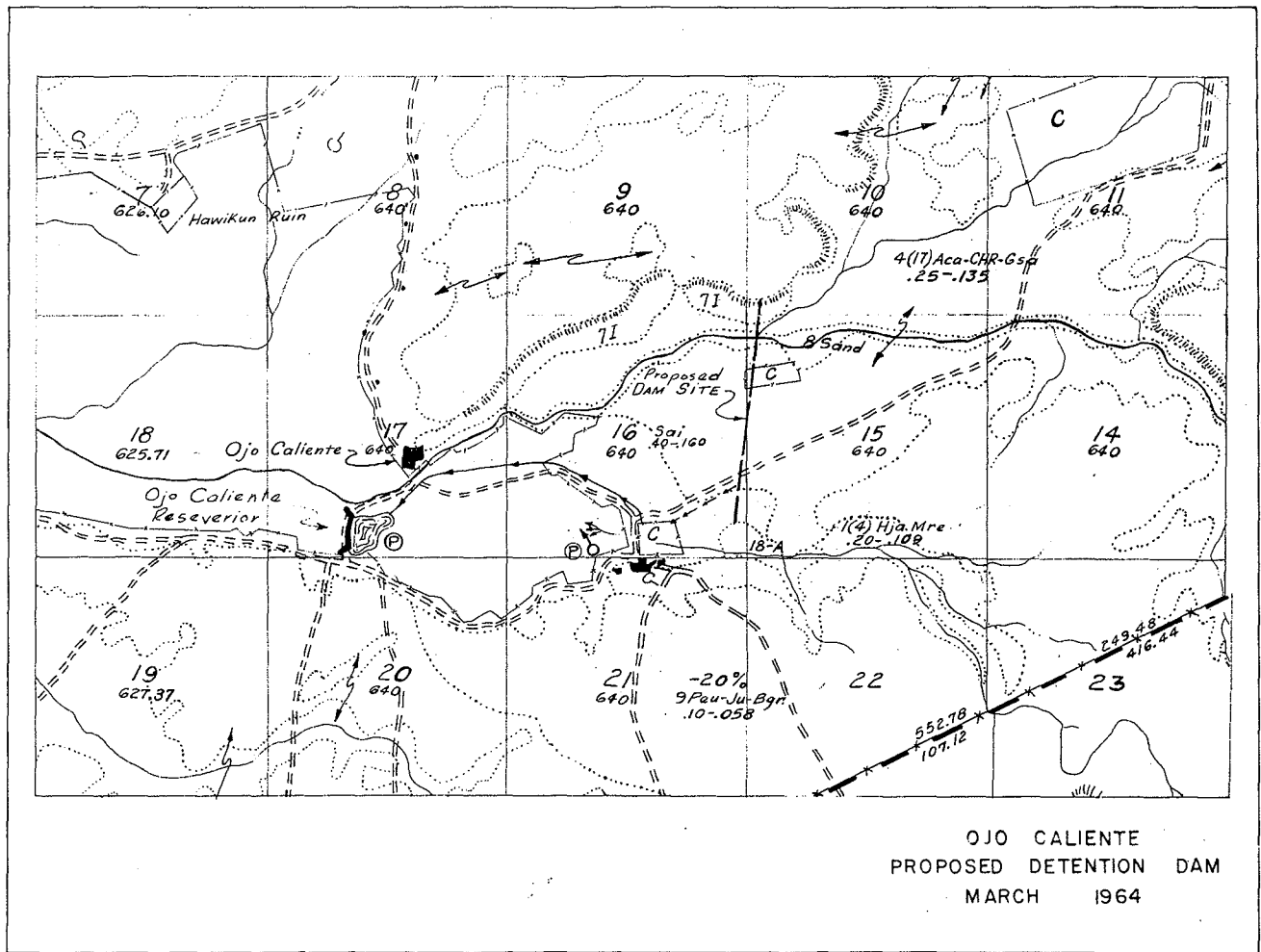
Sheet *1* of *1*

Prepared by *Vernon J. Larsen*

Uniform Cost Classification	DESCRIPTION	Quantity	Unit Cost	Total Estimate	Construction Contracts	Materials and Supplies	Labor	Construction Facilities	Other Costs	Previous Official Estimate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	<i>Zuni Project</i>									
	<i>Unit Acres Indian Acres Non Indian</i>									
	<i>Nutria 200</i>									
	<i>Pescado 350</i>									
	<i>Zuni 1000</i>									
	<i>Tekapo 0</i>									
	<i>Ojo Caliente 400</i>									
	<i>Total 1950</i>									
	<i>Nutria</i>									
	<i>Storage 100 Acre-foot</i>			\$ 95,000						
	<i>Canal system</i>			126,000						
	<i>Pescado</i>									
	<i>Storage</i>			108,000						
	<i>canal system</i>			280,000						
	<i>Zuni</i>									
	<i>Storage Nutria #2</i>			524,000						
	<i>Storage Pescado</i>			132,000						
	<i>Main canal</i>			126,000						
	<i>lateral system</i>			231,000						
	<i>Ojo Caliente</i>									
	<i>Detention dam irrigation share</i>			61,000						
	<i>lateral system</i>			145,000						
	<i>Total</i>			1,838,000						
	<i>Farm unit Development (Zuni only)</i>			247,000						
	<i>Total</i>			\$ 2,085,000						



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BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES
CLASS	IDENTIFICATION		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY
		<i>Nutria</i>													
		<i>Nutria</i>													
		<i>Over Night Storage</i>													
		<i>Over night Storage for 100 acre feet</i>	161,300	cy	.30	48,000									
		<i>Back fill for spillway</i>	3,555	cy	1.00	3,555									
		<i>Concrete Three sided Spillway</i>	100	sl	75.00	7,500									
		<i>Steel for spillway in place</i>	5,000	lbs	.20	1,000									
		<i>Drain for spillway</i>	200	lft	2.00	400									
		<i>Connection to Tunnel</i>	1000	lob	1.00	1,000									
		<i>Pipe Connection 36" dia</i>	50	lft	14.00	700									
		<i>Gravel blanket spillway approach</i>	150	cy	5.00	750									
		<i>Rip Rap Spillway approach</i>	622	cy	10.00	6,220									
						69,125									
		<i>15% contingencies</i>				10,369									
						79,494									
		<i>Canal system</i>													
		<i>prepare canal bed compact grade</i>	26,000	lft	1.00	26,000									
		<i>cut 4 lay concrete lining</i>	26,000	lft	2.00	52,000									
		<i>Turn cuts 18" dia Swanson 5500</i>	45	each	25.00	1,125									
		<i>Concrete work on turn cuts</i>	45	each	20.00	900									
		<i>Pipe extensions 18" (45-16')</i>	120	lft	4.75	570									
		<i>Gate stops with gaskets Swanson</i>	30	each	6.00	180									
		<i>Gate stops with slide gates</i>	10	each	20.00	200									
		<i>Canal crossing 18" dia 40-16'</i>	640	lft	8.00	5,120									
						91,285									
		<i>Contingencies 15%</i>				13,693									
						104,978									

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BASIC ESTIMATE

PROJECT *Zuni - Nutria Unit*
 DATE OF ESTIMATE *March 1964*
 PRICES AS OF *1963*
 SHEET *1* OF *1* SHEETS

	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
<i>Storage</i>				370													
<i>for 100 acre feet</i>	<i>161,300</i>	<i>CY</i>	<i>.30</i>	<i>48,000</i>													
	<i>3,555</i>	<i>CY</i>	<i>1.00</i>	<i>3,555</i>													
	<i>100</i>	<i>CSY</i>	<i>75.00</i>	<i>7,500</i>													
<i>1/2 d spillway</i>	<i>5000</i>	<i>lbs</i>	<i>.30</i>	<i>1500.00</i>													
<i>in place</i>	<i>200</i>	<i>lft</i>	<i>2.00</i>	<i>400</i>													
<i>del</i>	<i>1000</i>	<i>Job</i>	<i>1.00</i>	<i>1000</i>													
<i>36" dia</i>	<i>50</i>	<i>l-ft</i>	<i>14.00</i>	<i>700</i>													
<i>drillway approach</i>	<i>150</i>	<i>l-ft</i>	<i>5.00</i>	<i>750</i>													
<i>approach</i>	<i>622</i>	<i>CY</i>	<i>10.00</i>	<i>6220</i>													
				<i>69,125</i>													
				<i>10,369</i>													
				<i>79,494</i>										<i>15,899</i>			<i>95,393</i>
<i>compact grade</i>	<i>26,000</i>	<i>l-ft</i>	<i>1.00</i>	<i>26,000</i>													
<i>ing</i>	<i>26,000</i>	<i>l-ft</i>	<i>2.00</i>	<i>52,000</i>													
<i>anson 5500</i>	<i>45</i>	<i>each</i>	<i>25.00</i>	<i>1,125</i>													
<i>20 OUTS</i>	<i>45</i>	<i>each</i>	<i>20.00</i>	<i>900</i>													
<i>(45-16)</i>	<i>720</i>	<i>l-ft</i>	<i>8.00</i>	<i>5760</i>													
<i>75 Swanson</i>	<i>30</i>	<i>each</i>	<i>6.00</i>	<i>180</i>													
<i>2 gates</i>	<i>10</i>	<i>each</i>	<i>20.00</i>	<i>200</i>													
<i>45 40-16</i>	<i>640</i>	<i>l-ft</i>	<i>8.00</i>	<i>5120</i>													
				<i>91,285</i>													
				<i>13,693</i>													
				<i>104,978</i>										<i>20,260</i>			<i>125,238</i>

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BASIC ESTIMATE

CLASS	PROPERTY IDENTIFICATION	DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	IN EN C
			AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	
1		2	3		4		5		6		7		8	9	10	
		Vasset Lateral														
		prepare canal bed	2700	1 ft	1.00	2700										
		cut and lay concrete lining	2700	1 ft	2.00	5400										
		Turnouts														
		24" dia (Armed 101)	8	each	98.00	784										
		15" dia (Armed 105)	12	each	41.00	492										
		Construct Head wall + Transition (24")	8	each	130.00	1040										
		Pipe extensions														
		24" dia in place (3)	340	1 ft	10.00	3400										
		15" dia in place	360	1 ft	6.00	2160										
		Earth work Headgates 24"	6	each	30.00	180										
		Install 105 Armed gates	12	each	10.00	120										
		Check drops	11	each	350.00	3850										
		Earth work for check drops	11	each	75.00	825										
		Canal crossings														
		24" dia 3	90	1 ft	10.00	900										
							20851									
							3128									
							23979									
		Zuni Lateral														
		prepare canal bed	11000	1 ft	1.00	11000										
		cut and lay concrete lining	11000	1 ft	2.50	27500										
		Turnouts														
		24" dia Armed 101	9	each	98.00	882										
		18" dia Armed 101	6	each	82.00	492										
		Pipe extensions														
		24" dia	360	1 ft	10.00	3600										
		18" dia	180	1 ft	8.00	1440										
		Head wall transitions for headgates	15	each	130.00	1950										
		Earth work for headgates	15	each	30.00	450										
		Check drops	25	each	350.00	8750										
		Earth work for drops	25	each	75.00	1875										
		Canal crossings C.M.P. or R.C.P.														
		24" dia 10	300	1 ft	10.00	3000										
							60939									
							9141									
							70080									

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BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 5 OF 7 SHEETS

N	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3			4		5		6		7	8	9	10	11	12	13	14
red	2700	1.ft.	1.00	2700													
concrete lining	2700	1.ft.	2.00	5400													
2 101	8	each	98.00	784													
2 105	12	each	41.00	492													
+ Transition (24")	8	each	130.50	1040													
alms (3)	240	1.ft.	10.00	2400													
alms	360	1.ft.	6.00	2160													
gates 24"	6	each	30.00	180													
gates	12	each	10.00	120													
wh drops	11	each	35.00	385													
	11	each	75.00	825													
3	90	1.ft.	10.00	900													
				20851													
				3128													
				23979													
														4796			28735
red	11000	1.ft.	1.00	11000													
concrete lining	11000	1.ft.	2.50	27500													
2 101	9	each	78.00	702													
2 101	6	each	82.00	492													
	360	1.ft.	10.00	3600													
	180	1.ft.	8.00	1440													
is. for headgates	15	each	135.00	1950													
headgates	15	each	30.00	450													
	25	each	350.00	8750													
drops	25	each	75.00	1875													
C.M.P. or R.C.P.	300	1.ft.	10.00	3000													
101				60939													
				9141													
				70080													
														14016			84096

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BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS 4, 5 & 6		PRG AC
CLASS	IDENTIFICATION		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	
		<i>Passadito Dam</i>											
		<i>Diversion Dam (Feeder Canal)</i>											
		<i>Repair Diversion dam</i>	2.5			500							
		<i>Canal gate, 1 gate radial gate</i>	1.5			900							
		<i>Hoist in place</i>				300							
		<i>Structure for gate concrete</i>	1.2	CF	125	150							
									4,350				
									653				
									5,003				
		<i>Feeder Canal</i>											
		* <i>sur flow wall 200 x 4' x 2 Rock M</i>	30	CF	50	1500							
		* <i>slide gate 36 dia Armer 101</i>	1	EG	300	300							
		* <i>Head wall gate work</i>	1	Each	500	500							
		* <i>Pipe extension 36</i>	28	LF	14	392							
		* <i>Slide gate 24 dia Armer 101</i>	1	Each	98	98							
		* <i>Head wall gate work</i>	1	Each	500	500							
		* <i>Pipe extension</i>	24	LF	10	240							
		* <i>pipe chute with intake plus parts</i>	2	Each	6308	12616							
		<i>Enlarge Canal</i>	6800	LF	100	680000							
									22,834				
									3425				
									26259				
		<i>Reservoir Enlargement basic dam</i>											
		<i>Dam embankment earth water wall</i>	65000	CF	070	45500							
		<i>Gravel blanket</i>	3512	CF	300	10536							
		* <i>Pipe line</i>	7024	CF	700	49168							
		<i>Core trench</i>	7680	CF	500	38400							
		* <i>Extend outlet pipe</i>	70	LF	2000	14000							
		* <i>Extend gate tower</i>	10	LF	2800	28000							
		* <i>Gate walk to tower</i>	1.5	LF	250	375							
		* <i>Outlet transition</i>	1.5	CF	125	187							
		* <i>Close work on outlet</i>				1000							
		* <i>Spill way Rock Masonry</i>	342	CF	500	17100							
		* <i>Earthwork Spillway</i>	18			1000							
		<i>Embankment like bottom fall</i>	76500	CF	200	153000							
		<i>Right of way permanent</i>	38	acre	20000	76000							
		<i>Right of way easement</i>	95	acre	10000	95000							
									167463				
									197463				
		* <i>Work that would be available to APN Program</i>											

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BASIC ESTIMATE

PROPERTY CLASS IDENTIFICATION	DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES
		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY
	2	3		4		5		6		7		8	9	10
	Zuni Main Canal													
	* Tile drain Rock lined section	900	L.F.	3.00	2700									
	Repair rock lined section	900	L.F.	3.50	3150									
	Install 4' Parshall Flume Concrete	1	Job	1.5	1350									
	Repair inlet and outlet siphon #1	1	Job	4.5	3445									
	Construct drain for siphon #1	1	Job	5.5	2000									
	Repair main canal fill low spots													
	Raise canal banks + Build storm dikes from dam to Highway # 53	38,290	L.F.	1.00	38,290									
	Turn outs MAT screw type													
	30"	3	each	170 ⁰⁰	510									
	24"	2	each	98 ⁰⁰	196									
	18"	14	each	82 ⁰⁰	1148									
	Pipe Extensions													
	30" (3)	90	L.F.	12 ⁰⁰	1080									
	24" (2)	60	L.F.	10 ⁰⁰	600									
	18" (14)	420	L.F.	8 ⁰⁰	3360									
	Head wall for head gate concrete	19	each	273 ⁰⁰	5187									
	Earth work for head gate	49	each	700 ⁰⁰	34300									
	Canal Crossings													
	42" dia (3)	68	luff	20 ⁰⁰	1360									
	36" dia (4)	112	luff	14 ⁰⁰	1568									
	Under pass culverts													
	42" dia	130	L.F.	12 ⁰⁰	1560									
	36" dia	98	L.F.	10 ⁰⁰	980									
	Head wall Masonry Rock	3	each	260 ⁰⁰	780									
	Over shot													
	42" dia pipe by 16' (3)	152	L.F.	20 ⁰⁰	3040									
	36" dia pipe by 16' (7)	532	L.F.	14 ⁰⁰	7448									
	Repairs for sand creek over shot	1	Job	1.5	1000									
	Pipe flume	2	Job	1.5	4000									
	Cont.													

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 2 OF 7 SHEETS

DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS. ENGRG AND GENL EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
lined section	900	L.Ft.	3.00	2700													
d section	900	L.Ft.	2.30	2070	2250												
Flume concrete	1	Job	1350	1350													
outlet siphon #1	1	Job	3445	3445													
for siphon #1	1	Job	2000	2000													
fill low spots																	
Build Storm Highway # 53	38,290	L.Ft.	1.00	38,290													
Crew type																	
	3	each	170 ⁰⁰	510													
	2	each	98 ⁰⁰	196													
	14	each	82 ⁰⁰	1148													
(3)	90	L.Ft.	12 ⁰⁰	1080													
(2)	80	L.Ft.	10 ⁰⁰	800													
(14)	420	L.Ft.	8 ⁰⁰	3360													
gate concrete	19	each	273 ⁰⁰	5187													
head gate	39	each	800 ⁰⁰	31200													
(2)	68	L.Ft.	20 ⁰⁰	1360													
(4)	112	L.Ft.	14 ⁰⁰	1568													
bits																	
	130	L.Ft.	12 ⁰⁰	1560													
	98	L.Ft.	10 ⁰⁰	980													
ray Rock	3	each	260 ⁰⁰	780													
(2)	152	L.Ft.	20 ⁰⁰	3040													
(7)	532	L.Ft.	14 ⁰⁰	7448													
Creek over shot																	
	1	Job	1000	1000													
	2	Job	2000	4000													
cont.																	

COPY

BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES
CLASS	IDENTIFICATION		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY
		2	3	4		5		6		7		8	9	10	
		Zuni Main Canal Continued													
		Drop for Overshot #2 Rock Masonry	57	CY	50 ⁰⁰	2850									
		Earth work for drop	1	Job	L.S.	300									
		Check drop main canal rock masonry	9.5	CY	50	475									
		Earth work for drop	1	Job	L.S.	100									
		Total				91,377		92,377							
		15%				13,707		106,084							
						105,074									

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 3 OF 7 SHEETS

N	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3			4		5		6		7		8	9	10	11	12	13
<i>Continued</i>																	
2	57	CY	50.00	2850													
	1	Job	L.S.	300													
2	9.5	CY	50	475													
	1	Job	L.S.	100													
				91,377		92.377											
				13,707													
15%				105,074		106.084								21,017			126,101

COPY

BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6	
CLASS	IDENTIFICATION		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST
		Schaal Farm Lateral										
		Prepare canal bed	47.50	1.ft.	1.00	47.50						
		Cut canal + lay concrete lining	47.50	1.ft.	2.00	95.00						
		Turn-outs 18" 101 calco	4	each	82.00	328						
		Turn-outs 15" 101 calco	2	each	56.00	112						
		Pipe Extensions										
		18" (3)	90	1.ft.	8.00	720						
		15" (5)	150	1.ft.	6.00	900						
		Construct Headwall Head gate 18"	3	each	130	390						
		Construct Headwall Head gate 15"	5	each	50	250						
		Earthwork for Head gate 18"	3	each	30	90						
		Earth work for Head gate 15"	5	each	20	100						
		Check drops	12	each	350	4200						
		Earth work for checks	12	each	70	840						
		Canal Crossings										
		CM. 24" dia (4)	120	1.ft.	10	1200						
		Siphon Crossing										
		pipe in place 15" dia	600	1.ft.	10.50	6300						
		excavation	600	1.ft.	2.00	1200						
		Core handling water	1	job	1.5	5.000						
		Inlet and outlet	2	each	250	500						
		Armco 101 Headgate 15" dia	1	each	56	56						
		Total				36,436						
		15%				5,465						
						41,901						

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 4 OF 7 SHEETS

ON	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTONS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
ral																	
l bed	47.50	1.ft.	1.00	47.50													
concrete lining	47.50	1.ft.	2.00	95.00													
101 calco	4	each	82.00	328													
101 calco	2	each	56.00	112													
(3)	90	1.ft.	8.00	720													
(5)	150	1.ft.	6.00	900													
all Head gate 18"	3	each	130	390													
all Head gate 15"	5	each	50	250													
ad gate 18"	3	each	30	90													
ad gate 15"	5	each	20	100													
	12	each	350	4200													
check's	12	each	70	840													
(4)	120	1.ft.	10	1200													
19																	
15' dia	600	1.ft.	10.50	6300													
	600	1.ft.	2.00	1200													
water	1	Job	65	5,000													
st	2	each	250	500													
ad gate 15" dia	1	each	56	56													
Total				36,436													
15% ^o				5,465													
				<u>41,901</u>										8,380			5028

COPY

BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6	
CLASS IDENTIFICATION	2		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST
		West Dam										
		Prepare Canal bed	6000	lft.	1.00	6000						
		Put 4 in concrete lining	6000	lft.	2.00	12000						
		Turn outs										
		24" dia	4	each	98.00	392						
		15" dia	3	each	56.00	168						
		Pipe extensions										
		24" dia (7)	210	lft.	10.00	2100						
		15" dia (3)	90	lft.	6.00	540						
		Head wall transitions 24" dia	7	each	130.00	910						
		Head wall transitions 15" dia	3	each	50.00	150						
		Earth work 24"	7	each	30.00	210						
		Earth work 15"	3	each	20.00	60						
		Check drops	25	each	350.00	8750						
		Earth work for drops	25	each	75.00	1875						
		Canal Crossings										
		24" CMP or P.C.P. (8)	240	lft.	10.00	2400						
						35,849						
						5,377						
						41,226						
		Zuni Sublateral										
		Prepare Canal bed	1980	lft.	1.00	1980						
		Put 4 in concrete lining	1980	lft.	2.00	3960						
		Turn outs										
		24" dia 101 Armco	3	each	98.00	294						
		18" dia 105 Armco	8	each	42.00	336						
		Pipe extensions										
		24" dia (3)	90	lft.	10.00	900						
		18" dia (18)	240	lft.	8.00	1920						
		Head wall Transitions	3	each	130.00	390						
		Earth work 24" gates	3	each	30.00	90						
		Install 105 Armco type gates	8	each	10.00	80						
		Check drops	8	each	350.00	2800						
		Earth work check drops	8	each	75.00	600						
						13,350						
						2,002						
						15,352						

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 6 OF 7 SHEETS

	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
bed	6000	lft.	1.00	6000													
linning	6000	lft.	2.00	12000													
	7	each	98.00	686													
	3	each	56.00	168													
(7)	210	lft.	10.00	2100													
3	90	lft.	6.00	540													
CHS 24" dia	7	each	130.00	910													
CHS 15" dia	3	each	50.00	150													
24"	7	each	30.00	210													
15"	3	each	20.00	60													
	25	each	350.00	8750													
drops	25	each	75	1875													
P.C.P. (8)	240	lft.	10.00	2400													
				35,848													
				5,377													
				41,226													
														8245			49,471
bed	1980	lft.	1.00	1980													
linning	1980	lft.	2.00	3960													
10" Armco	3	each	98.00	294													
105" Armco	8	each	42.00	336													
	90	lft.	10.00	900													
(8)	240	lft.	8.00	1920													
CHS	3	each	130.00	390													
gates	3	each	30.00	90													
type gates	8	each	10.00	80													
	8	each	350.00	2800													
drops	8	each	75	600													
				13,350													
				2,008													
				15,352													
														3,070			18,422

COPY

BASIC ESTIMATE

PROPERTY		DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST
CLASS	IDENTIFICATION		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT
		2	3		4		5		6		7		8
		Shawm Unit Development											
		Land leveling & filling grading	1000	acres	120	120,000							
		Farm Ditches	11800	lft.	10	7,180							
		Checks	109	each	250	28,150							
		Earth work for checks	109	each	75	8,175							
		Ditch crossings											
		24 x 230	18		540	10.00	5,400						
							178,905						
							26,836						
							205,741						

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 7 OF 7 SHEETS

DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTMENTS ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS.	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
Plant																	
Dipping grading	1300	acres	120	120,000													
	71,800	lft.	10	7,180													
checks	109	each	350	38,150													
	109	each	75	8,175													
18	540	lft.	10.00	5,400													
				178,705													
				26,836													
				205,741										41,148			246,889

COPY

BASIC ESTIMATE

PROPERTY CLASSIFICATION	DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES
		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY
	2	3		4		5		6		7		8	9	10
	Ojo Caliente													
	Detention Reservoir													
	Core trench excavate	40,800	cy	20	8,160									
	Core trench Back fill	40,800	cy	50	20,360									
	Dam embankment core	108,777	cy	30	54,388									
	Dam embankment	477,000	cy	20	195,800									
	Spillway													
	1-66" in place (steel Markedwood)	290	LF	50.00	14,500									
	cut off rollers - each	116	cy	125.00	14,500									
	Concrete intake Box	13	sq	125.00	1,625									
	Earthwork misc	166		1.5	1,000									
					299,122									
					44,568									
					343,690									
	Conduit 24" dia in place	432	LF	24.00	10,368									
	Tower 15" pipe 40" dia	33	LF	16.00	528									
	Gate 24" dia			1.5	600									
	Gate stem 2 dia			4.5	150									
	Splices + joints			1.5	200									
	Gate lift			1.5	500									
	Concrete				1000									
	Earthwork 14" dia				1000									
					18,650									
					1,774									
					20,424									
	Factor manual													
	17-20" dia detention distribution	7920	sq	1.50	11,880									
	17-20" dia concrete 7" earth work	17	sq	700	11,900									
					13,780									
					1,351									
					15,131									

COPY

BASIC ESTIMATE

PROJECT *San Joaquin Unit*
 DATE OF ESTIMATE *Jan 1968*
 PRICES AS OF
 SHEET *1* OF *3* SHEETS

DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTIGS. ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
<i>Site</i>	<i>40,600</i>	<i>cy</i>	<i>.25</i>	<i>8,150</i>													
<i>Fill</i>	<i>40,600</i>	<i>cy</i>	<i>.50</i>	<i>20,300</i>													
<i>Core</i>	<i>108,777</i>	<i>cy</i>	<i>.50</i>	<i>54,388</i>													
	<i>979,000</i>	<i>cy</i>	<i>.20</i>	<i>195,800</i>													
<i>(Steel Marked)</i>	<i>290</i>	<i>LF</i>	<i>50.00</i>	<i>14,500</i>													
<i>each</i>	<i>111</i>	<i>cy</i>	<i>125.55</i>	<i>13,936</i>													
<i>Box</i>	<i>13</i>	<i>ply</i>	<i>125.55</i>	<i>1,632</i>													
	<i>126</i>		<i>1.5</i>	<i>189</i>													
				<i>299,122</i>													
				<i>44,568</i>													
				<i>343,690</i>											<i>343,690</i>	<i>410,873</i>	<i>31,183</i>
<i>1/4" pipe</i>	<i>432</i>	<i>LF</i>	<i>24.00</i>	<i>10,368</i>													
<i>2" dia</i>	<i>52</i>	<i>LF</i>	<i>16.00</i>	<i>832</i>													
			<i>1.5</i>	<i>600</i>													
			<i>1.5</i>	<i>150</i>													
			<i>1.5</i>	<i>300</i>													
			<i>1.5</i>	<i>500</i>													
				<i>1000</i>													
				<i>1000</i>													
				<i>13,650</i>													
				<i>1,774</i>													
				<i>15,424</i>													
<i>2" x 4" bolts</i>	<i>7,200</i>	<i>cy</i>	<i>1.30</i>	<i>9,360</i>													
<i>with nuts</i>	<i>1,300</i>	<i>each</i>	<i>2.00</i>	<i>2,600</i>													
				<i>15,676</i>													
				<i>4,351</i>													
				<i>18,027</i>													

COPY

BASIC ESTIMATE

PROPERTY CLASSIFICATION	DESCRIPTION	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INV ENGR
		AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY
		3		4		5		6		7	8	9	10		
	<i>Die 2 Caliente</i>														
	<i>Lateral system</i>														
	<i>Prepare canal bed for lining</i>	26,000	LF	1.20	26,000										
	<i>cut and lay concrete lining</i>	26,000	LF	2.00	52,000										
	<i>10" x 18" brass swanson S. 1500</i>	40	LF	25.00	1,000										
	<i>Concrete & labor installing gate</i>	40	LF	20.00	800										
	<i>Pipe extension 18" (40x16)</i>	640	LF	8.00	5,120										
	<i>Gate stop with Gasket Swanson</i>	20	each	9.00	180										
	<i>Gate stop with slip gate</i>	10	each	20.00	200										
	<i>Canal crossings 18" (30x16)</i>	480	LF	8.00	3,840										
	<i>Siphon</i>														
	<i>pipe 24" dia.</i>	300	LF	15.00	4,500										
	<i>cut trench</i>	300	LF	5.00	1,500										
	<i>inlet & outlet transitions</i>	3	each	200.00	600										
	<i>earth work inlet & outlet</i>	Job	LS		100										
	<i>channel control siphon protection etc</i>	Job	LS		900										
					104,840										
	<i>Contingencies 15%</i>				15,726										
					120,566										

COPY

BASIC ESTIMATE

PROJECT
DATE OF ESTIMATE
PRICES AS OF
SHEET 2 OF 2 SHEETS

N	QUANTITY		LABOR AND MATERIALS BY CONTRACTOR		LABOR BY GOVERNMENT (FORCE ACCOUNT)		MATERIALS AND EQUIPMENT BY GOVERNMENT		FIELD COST COLS. 4, 5, & 6		FIELD COST	FIELD COST	CONSTR. FACILITIES	INVESTGNS ENGRG. AND GENL. EXP.	TOTAL COST	TOTAL COST	TOTAL COST
	AMOUNT	UNIT	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	PROPERTY ACCOUNT	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	IDENTIFIED PROPERTY	PROPERTY CLASS	ALL CLASSES
	3		4		5		6		7		8	9	10	11	12	13	14
<i>aliante</i>																	
<i>for lining</i>	26,000	LF	1.20	26,000													
<i>lining</i>	26,000	LF	2.00	52,000													
<i>3/500</i>	40	LF	25.00	1,000													
<i>rolling gate</i>	40	LF	20.00	800													
<i>gate</i>	640	LF	8.00	5,120													
<i>of expansion</i>	20	each	9.00	180													
<i>gate</i>	10	each	20.00	200													
<i>2" (30x16)</i>	480	LF	8.00	3,840													
	300	LF	15.00	4,500													
	300	LF	5.00	1,500													
<i>visions</i>	3	each	200.00	600													
<i>outlet</i>	Job	LS		100													
<i>non protection etc</i>	Job	LS	45	9,600													
				104,840													
<i>15%</i>				15,726													
				120,566										24,113			144,679

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