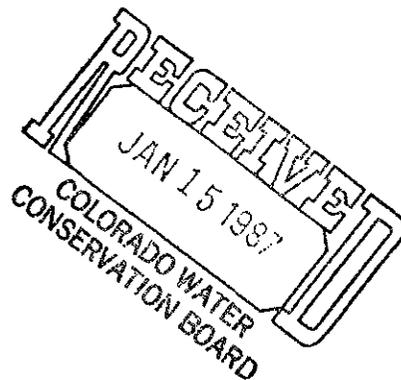


001478

ECONOMIC ANALYSIS OF POTENTIALLY
IRRIGABLE PARCELS IN THE
SAN JUAN WEST
WATERSHED



WESTERN RESEARCH CORPORATION
512 UNIVERSITY
LARAMIE, WYOMING 82070
(307) 742-8295

001479

ECONOMIC ANALYSIS OF POTENTIALLY
IRRIGABLE PARCELS IN THE
SAN JUAN WEST
WATERSHED

LEVEL B ANALYSIS
FINAL REPORT

Prepared for
State of Colorado
Department of Law

Prepared by
Western Research Corporation
512 University Avenue
Laramie, WY 82070

December, 1986

TABLE OF CONTENTS

1.0	Introduction	1
2.0	Soil Suitability	2
3.0	Land Clearing and Preparation.	2
4.0	Farm Efficiency Adjustments.	5
5.0	Results of Level B Analysis for the San Juan West Watershed.	5
6.0	Conclusions.	8
APPENDIX A Estimation of Clearing and Grubbing Costs		
APPENDIX B Revised Crop Budgets for the San Juan West Watershed		

LIST OF TABLES

Table 3-1	Estimated Canopy and Brush Removal Costs by Land Category	4
Table 5-1	Level B Economic Analysis San Juan West Watershed.	7
Table B-1	Net Returns Analysis for a 204 Acre Operation in the San Juan West Watershed	

1.0 Introduction

The Level A economic analysis of potentially irrigable acreage (PIA) on the Southern Ute and Ute Mountain Ute Indian Reservations specifies crop budgets and gives estimates of on-farm returns for potentially irrigable lands in ten different climatic zones. (The Level A economic analysis is described in a separate report.) The results of the Level A economic analysis were used by Boyle Engineering to identify land parcels in the San Juan West Watershed that, based upon preliminary investigations, had sufficient on-farm returns to justify water delivery costs. This report describes a Level B economic analysis of individual parcels in the San Juan West Watershed preliminarily classified as PIA by Boyle Engineering. The purpose of this Level B economic analysis is to make any necessary adjustments in the economic analysis to reflect the unique characteristics of individual parcels.

The Level B economic analysis includes three factors that were not considered in the Level A analysis. First, land classes (soil types) that may affect crop suitability are considered and changes in cropping patterns are made when indicated. Second, the Level B economic analysis incorporates land preparation charges for tree, brush and grass removal that will be necessary prior to irrigated agricultural use. Finally, the Level B economic analysis considers economies of scale and farm efficiency factors as they apply to individual parcels or groups of parcels and makes any adjustments in cost and/or returns necessary for a final PIA determination. The methods used in making these adjustments are described below.

2.0 Soil Suitability

The Level A economic analysis considered several alternative cropping patterns for each climatic zone, and derived an estimated repayment capacity based upon that cropping pattern that maximized on-farm returns. No distinctions were made between various land classes in developing the Level A repayment capacities. Instead, the favorable assumption was made that all parcels were capable of producing crops and yields associated with Class 1 soils.

In some cases, however, individual parcels are unsuitable for the cropping patterns associated with Class 1 soils. Thus, the first step in the Level B economic analysis was to substitute an appropriate cropping pattern, if necessary, based upon the land classification of the parcel under consideration. The crop suitability assessments were based upon the results of the agronomic study conducted by Boyle Engineering. Once an appropriate cropping pattern was substituted, on-farm returns were recalculated using the new cropping pattern, and appropriate adjustments were made to the repayment capacity estimate for the parcel.

3.0 Land Clearing and Preparation

The Level A economic analysis included the costs of seedbed tillage operations necessary to establish irrigated crops on untilled soil. The Level A analysis did not, however, include the costs of canopy and brush removal costs prior to seedbed preparation. These costs were omitted from the Level A analysis because they can vary from parcel to parcel depending upon the extent of canopy cover. To estimate canopy and brush removal costs, parcels were classified into

one of three categories based upon the land classification analysis performed by Stoneman, Landers, Inc. These categories are:

- Category I - Land classifications identified by Stoneman, Landers, Inc. as having less than 10 percent tree cover. Parcels in this category were assumed to require no canopy removal, although removal of a medium growth of grasses and brush was assumed.
- Category II - Land classifications identified by Stoneman, Landers, Inc. as having 10 to 40 percent tree cover. Parcels in this category were assumed to require canopy removal on 25 percent of the parcel's acreage, along with grass and brush removal.
- Category III - Lands identified by Stoneman, Landers, Inc. as having more than 40 percent tree cover. Parcels in this category were assumed to require canopy removal on 70 percent of the parcel's acreage, along with grass and brush removal.

Estimates of the per acre costs of canopy, brush and grass removal were based upon data obtained from the U.S. Soil and Conservation Service, Durango, Colorado, Rick Gruen, CSU Ag Extension Agent, and other sources. The methods employed in estimating these costs are given in a memorandum by John Raines, Western Research Corporation, dated July 21, 1986. A copy of that memorandum is included as Appendix A to this report.

The results of the canopy, grass and brush removal cost analysis are given in Table 3-1.

Table 3-1
Estimated Canopy and Brush Removal Costs
by Land Category

<u>Land Category</u>	<u>Current Cost/Acre (1985 Dollars)</u>	<u>Annualized Cost/Acre</u>
I	\$35.00	\$3.00
II	57.00	4.85
III	95.00	8.10

The second column of Table 3-1 is the estimated current cost per acre for each clearing operation. The third column gives annualized cost estimates over 50 years with an 8 3/8 percent discount rate. The latter figures were used in adjusting preliminary repayment capacities since they are also annualized.

It should be noted that the costs given in Table 3-1 do not include costs for unskilled labor. This adjustment was made because land clearing and preparation costs were assumed to be a construction activity. The U.S. Water Resources Council (WRC) Principles and Guidelines (1983) allow for the use of a zero opportunity cost for unskilled labor in construction activities on water projects if the project area is one of high unemployment. For purposes of this analysis, it was assumed that the high unemployment assumption holds.

It should be noted that land leveling costs are not explicitly addressed in either the Level A or Level B economic analyses. Any such costs necessary to adapt an appropriate irrigation technology to the contours of a parcel were considered in the agricultural engineering analysis conducted by Boyle Engineering.

4.0 Farm Efficiency Adjustments

The Level A analysis crop budgets assume farm efficiencies equal to that of a contiguous 1000 acre operation. That is, it was assumed that at least 1000 acres could be farmed using one equipment complement stored in a central equipment warehouse without excessive transportation costs. In the Level B economic analysis, two types of farm efficiency adjustments were made for certain parcels. The first adjustment was for economies of scale where there were fewer than 600 acres of current or newly irrigated new acreage that could be farmed as one unit. The 600 acre cutoff figure was used because economies of scale decline rather steeply below this point.

A second type of adjustment for some parcels involved transportation costs for on-farm equipment. These adjustments were made in cases where isolated parcels could not be easily served out of a central equipment warehouse. In cases where individual parcels were more than five miles from the assumed location of a central equipment warehouse, an additional transportation cost for transporting equipment to and from the parcel from a central location was assumed. The effects of these adjustments on the parcels identified as preliminary PIA in the San Juan West Watershed are given in the following sections.

5.0 Results of Level B Analysis for the San Juan West Watershed

Boyle Engineering's Task D and E Report for the San Juan West Watershed, dated September, 1986, identifies three parcels as having residual repayment capacities high enough to justify water delivery charges. All of these parcels are currently unirrigated, but show the

potential for having the benefits of irrigation exceed the costs of converting them to irrigated agricultural use.

The three potentially irrigable parcels in the San Juan West Watershed are listed in Table 5-1, along with a description of the characteristics of each parcel. The first four columns of Table 5-1 give the parcel number, net irrigable acres, land class and climatic zone descriptions for each parcel. The fifth column of Table 5-1, entitled "Cropping Pattern Suitability", provides an indication of whether the cropping pattern that maximizes repayment capacity is suitable for the land class of the individual parcel under consideration. Column six of Table 5-1 provides a description of the percentage amount of tree canopy on each parcel, and column seven provides a description of the parcel's distance from the theoretical central location of a farm equipment warehouse. The remaining columns in Table 5-1 describe any adjustments that were made to preliminary repayment capacity to reflect each parcel's characteristics.

As Table 5-1 shows, Parcels SW76, SW81 and SW82 constitute approximately 204 acres of potentially irrigable lands in climatic zone A in the San Juan West Watershed. These parcels are in close proximity to each other, and could be farmed as a single unit. All three of these parcels have land classes suitable for the corn and soybean crop rotation that maximizes repayment capacity for climatic zone A (see Level A Economic Analysis Report).

The combined size of these parcels is too small to achieve the 1000 acre economies of scale assumed in the Level A analysis. Furthermore, since there is no currently irrigated acreage in close

001487

TABLE 5-1
 Level B Economic Analysis
 San Juan West Watershed

PARCEL DESCRIPTION							ANNUAL RETURNS				
<u>Parcel #</u>	<u>Net Acres</u>	<u>Land Class</u>	<u>Climatic Zone</u>	<u>Cropping Pattern Suitability</u>	<u>Tree Canopy</u>	<u>Distance from Warehouse</u>	<u>Residual Repayment Capacity</u>	<u>Land Clearing Adjustment</u>	<u>Cropping Pattern Adjustment</u>	<u>Farm Efficiency Adjustment</u>	<u>Adjusted Residual Repayment</u>
SW76	99.9	3A	A	Suitable	< 10%	< 5 mi.	\$ 48.00	- \$3.00	\$ 0.00	- \$55.00	-\$10.00
SW81	46.5	3A	A	Suitable	< 10%	< 5 mi.	67.00	- 3.00	0.00	- 55.00	9.00
SW82	57.4	3A	A	Suitable	< 10%	< 5 mi.	65.00	- 3.00	0.00	- 55.00	7.00

Source: Western Research Corporation, November, 1986

001488

proximity to these parcels, no economies of scale could be achieved by incorporating them into an existing operation. Thus, a revised set of crop budgets for a 204 acre corn and soybean crop rotation was developed.

The details of the crop budget analysis for Parcels SW76, SW81 and SW82 are described in Appendix B to this report. A summary of the results is given in the farm efficiency adjustment column of Table 5-1. That column shows that farming the three parcels as a 204 acre unit would decrease repayment capacity by \$55.00 per acre from the level that could be achieved with a 1000 acre operation. The last column of Table 5-1 shows adjusted residual repayment capacity for each parcel after subtracting both land clearing charges and the farm efficiency adjustment from residual repayment capacity. The results show that Parcel SW76, consisting of approximately 100 acres, should be dropped from consideration as potential PIA because its adjusted residual repayment capacity is negative. Parcels SW81 and SW82, however, still qualify as potential PIA after the Level B economic analysis.

6.0 Conclusions

The preliminary analysis of potentially irrigable parcels in the San Juan West Watershed resulted in the elimination of one parcel, SW76, as potential PIA. The Level B economic analysis of two other parcels totaling 104 acres, did not eliminate them from further consideration. Prior to finalizing recommendations for these parcels, an on-site inspection should be made to verify individual parcel characteristics.

001489

APPENDIX A

Estimation of Clearing and Grubbing Costs

MEMORANDUM

TO: Ute Economic Analysis File
FROM: John Raines, Western Research Corporation
DATE: July 21, 1986
RE: Clearing and Grubbing

1.0 Introduction

WRC's crop budgets include seed bed tillage operations specific to each crop being grown. However, they do not include any canopy and brush clearing costs required prior to preparation for crop production. Land leveling costs are assumed to be negligible or incorporated into the costs of developing the specific irrigation system to be used on the parcel and are not included in the clearing costs or crop budgets.

This memorandum describes the land cover class assumptions, analytical methodology, and clearing costs by land cover class. The clearing costs are annualized assuming 8.375 percent interest over a 50 year project life.

2.0 Methodology

A. Classes of Land Cover

Three land cover classes are described by the amount of juniper and pinion pine tree cover on the parcel:

- I - less than 10 percent tree cover
- II - 10 to 40 percent with an average of 25 percent tree cover
- III - more than 40 percent with an average of 70 percent tree cover

All uncanopied rangeland is assumed to be covered with light to medium growth of grasses and brush.

B. Costs of Brush and Tree Cover Removal

(1) Brush: according to Rick Gruen, CSU Ag Extension agent and Dan Linn, Soil Conservation Service, Durango, the common method for clearing grasses and brush in the area includes three operations; chemical spraying, root plowing and chopping. The per acre costs for these operations are as follows:

- chemical spraying
 - Aerial custom rate - \$ 4.00/acre
 - 2 quarts 2,4-D - 8.25/acre
 - plow, 14"- 16" deep - 10.00/acre
 - brush chopper - 20.00/acre
- \$42.25/acre

(2) Tree Cover:

- crew comprised of 4 laborers, 2 dozer operators, and 1 foreman
 - Laborers-4 X \$5.00/hr. X 1.2 overhead = \$24.00/hr.
 - 2 acres/hr. accomplishment rate \$ 12.00/acre
 - Foreman- 1 X \$5.00/hr. X 1.2 overhead = \$6.00/hr.
 - 2 acres/hr. accomplishment rate 3.00/acre
 - (dozer operators included in custom rate)
 - custom rental rate with operator
 - \$85/hr., assume 2 dozers required at
 - 2 acres/hr. accomplishment rate 85.00/acre
- \$100.00/acre

3.0 Costs by Land Cover ClassA. Labor costs included:

	<u>Current per acre</u>	<u>Annualized per acre</u>
I	\$ 42	\$ 3.60
II	67	5.75
III	112	9.60

B. Partial labor costs excluded:*

	<u>Current per acre</u>	<u>Annualized per acre</u>
I	\$ 35	\$ 3.00
II	57	4.85
III	95	8.10

* Assumes unskilled labor valued at zero opportunity cost.

APPENDIX B

Revised Crop Budgets for the
San Juan West Watershed

B.1 Summary

Revised crop budgets for corn and soybeans were prepared for a 204 acre operation in the San Juan West Watershed. Yields for these crops were held at the same levels as used in the Level A analysis for a 1000 acre operation. Equipment complements for the farm operation were revised, however, to reflect the smaller size operation. Copies of the computer output for the revised budgets are attached.

A summary of the revised crop budget results is given in Table B-1. The overall return per acre was computed by multiplying the net return for each crop by its proportion of the cropping pattern, and then summing these weighted averages over all crops. An efficiency adjustment factor of 1.1 was used to reflect the possibility that under ideal conditions, it might be possible to achieve returns of up to 10 percent higher than those projected through the crop budgeting process. The adjusted net return of \$320.36 is about \$55.00 per acre lower than the corresponding figure of \$375.00 per acre for a 1000 acre operation.

Table B-1
Net Returns Analysis for a
204 Acre Operation in the
San Juan West Watershed

Crop	Cropping Proportion	Net Returns Per Acre	Weighted Net Returns
Corn Grain	.750	\$ 332.77	\$ 249.58
Soybeans	.250	166.63	<u>41.66</u>
Overall Net Return			\$ 291.24
Efficiency Adjustment Factor			1.10
Adjusted Net Return			\$ 320.36

Source: Western Research Corporation, October, 1986.

001496

COLORADO - UTE PROJECT - SAN JUAN WEST - ZONE A
CORN, GRAIN

TOTAL CROPLAND ACRES	204.0	EXPECTED YIELD PER ACRE	180.0
ACRES THIS CROP BUDGET	153.0	ANIMAL UNITS OF GRAZING	2.5

OPERATION	ACRES /HOUR	PURCHASED MATERIALS AMOUNT /ACRE	COST /UNIT	MACHINERY COSTS FUEL AND LUBE	REPAIR AND MAINT.	FIXED	TOTAL COSTS
Moldboard Plow	4.40			1.31	2.66	10.13	14.10
Tandem Disc	6.90			0.84	1.52	5.82	8.17
Anhydrous Applicator (LBS. NH3)	5.30	210.00	0.13	1.09	1.78	7.14	10.02
Tandem Disc	6.90			0.84	1.52	5.82	8.17
Roller Harrow	8.60			0.67	1.05	9.61	11.33
Sprayer (QT. ATRAZINE)	IN TANDEM	1.50	1.91	0.0	0.09	1.21	1.30
Planter (fert., herb., etc) (SEED 50LB. BAG)	5.20	0.32	67.50	1.11	2.21	11.64	14.96
(LBS. 16-20-0)		250.00	0.10				24.50
(LBS. COUNTER 15G)		8.00	1.49				11.92
Row Crop Cultivator	5.40			1.07	1.62	5.42	8.11
Row Crop Cultivator	5.40			1.07	1.62	5.42	8.11
Irrigation, Side Roll System 0.0 IN. APPLIED	0.0 *			0.0	0.0	0.0	0.0
Combine, Corn Head GRAIN DRYER (1/2 CROP)	CUSTOM 13.00*			4.95	1.35	1.93	8.23
Truck				2.07	0.41	1.66	4.14
Truck				2.88	0.58	2.30	5.76
Truck				2.88	0.58	2.30	5.76
TOTALS				20.77	16.98	70.42	224.36

* - MINUTES OF LABOR/ACRE

CASH COSTS

PURCHASED MATERIALS	88.18
FUEL AND LUBE	20.77
REPAIRS AND MAINTANANCE	16.98
CUSTOM HIRE AND MACHINE RENTAL	28.00
INTEREST ON OPERATING EXPENSE (153.93 X 8.38% FOR 6.0 MONTHS)	6.45
TOTAL CASH COSTS	160.38

LABOR

DIRECT LABOR (1.6 HRS X 5.00/HR X 1.2 (OVERHEAD))	9.61
TOTAL CASH COSTS AND LABOR	169.99

FIXED COSTS

FIXED MACHINERY COSTS (INCLUDES INTEREST AT 8.38%)	70.42
REAL ESTATE TAXES	0.0
INTEREST ON LAND (\$ 0.0 VALUE/A X 0.0 % X 0.0)	0.0
TOTAL FIXED COSTS	70.42
TOTAL COST, EXCEPT OVERHEAD AND MGT.	240.41

OVERHEAD AND MANAGEMENT

OVERHEAD (TOTAL CASH COSTS X 5.00%)	8.02
MANAGEMENT CHARGE (\$ 0.08 X ESTIMATED YIELD)	14.40
TOTAL OVERHEAD AND MANAGEMENT	22.42
TOTAL COST PER ACRE	262.83
TOTAL COST PER UNIT OF PRODUCTION (BASED ON ESTIMATED YIELD)	1.46

ESTIMATED RETURNS

ESTIMATED CROP RETURN PER ACRE	570.60
ESTIMATED AUM GRAZING RETURNS	25.00
ESTIMATED TOTAL RETURN PER ACRE	595.60
ESTIMATED NET RETURN PER ACRE	332.77

001497

San Juan West - Zone A - Corn, Grain Datafile

SECTION 1: * * * FIELD OPERATIONS * * *

OPERATION NUMBER	MACHINE NUMBER	MACHINE STATUS	DESCRIPTION
1	105	OWNED	Moldboard Plow
2	115	OWNED	Tandem Disc
3	605	OWNED	Anhydrous Applicator
4	115	OWNED	Tandem Disc
5	620	OWNED	Roller Harrow
6	655	OWNED	Sprayer
7	220	OWNED	Planter (fert., herb., etc)
8	315	OWNED	Row Crop Cultivator
9	315	OWNED	Row Crop Cultivator
10	715	OWNED	Irrigation, Side Roll System
11	415	CUSTOM	Combine, Corn Head
12	630	SPECIAL	GRAIN DRYER (1/2 CROP)
13	440	OWNED	Truck
14	440	OWNED	Truck
15	440	OWNED	Truck

SECTION 2: * * * TRACTORS * * *

TRACTOR NUMBER	HORSE-POWER	FUEL USE GAL/HR	FUEL PRICE \$/GAL	FUEL TYPE CODE	TOTAL ANNUAL USE (HR)	OWNER-SHIP STATUS	LIST PRICE	MODEL NAME
1	126.00	5.52	0.95	1	255.4	1	47392.00	MF 3545

SECTION 4: * * * OWNED, PULL-TYPE MACHINES * * *

LINE NO.	MACHINE NUMBER	TRACTOR USED	ACRES /HOUR	WIDTH (FT)	TOTAL USE/YR	LIST PRICE
1	115	1	6.90	16.00	408.00	10300.00
2	220	1	5.20	16.00	204.00	13800.00
3	315	1	5.40	16.00	408.00	4300.00
4	315	1	5.40	16.00	408.00	4300.00
5	605	1	5.30	21.00	153.00	4350.00
6	115	1	6.90	16.00	408.00	10300.00
7	105	1	4.40	16.00	153.00	7643.00
8	620	1	8.60	14.00	153.00	10900.00
9	655	IN TANDEM	8.60	21.00	153.00	1914.00

SECTION 9: * * * TRUCKS * * *

LINE NO.	TRUCK NUMBER	TRUCKING EXPENSE (\$/UNIT HARVESTED)
1	440	0.02
2	440	0.03
3	440	0.03

SECTION 10: * * * IRRIGATION * * *

MACHINE NO. 715, Irrigation, Side Roll System

LABOR MIN/ACRE	FUEL, LUBE \$/ACRE	REPAIRS, MAINT. \$/ACRE	FIXED COST \$/ACRE	WATER APPLIED (IN.)
0.0	0.0	0.0	0.0	0.0

SECTION 11: * * * CUSTOM OPERATIONS * * *

LINE NO.	MACHINE NUMBER	CUSTOM RATE PER ACRE (\$)
1	415	28.00

SECTION 12: * * * "SPECIAL" OPERATIONS * * *

LINE NO.	MACHINE NUMBER	LABOR MIN./ACRE	FUEL, LUBE \$/ACRE	REPAIRS, MAINT. \$/ACRE	FIXED COST \$/ACRE	DESCRIPTION
1	630	13.00	4.95	1.35	1.93	GRAIN DRYER (1/2 CROP)

001498 .

San Juan West - Zone A - Corn, Grain Datafile

SECTION 13: * * * PURCHASED MATERIALS * * *

LINE NO.	UNITS /ACRE	COST /UNIT	DESCRIPTION
OPERATION NO. 1	210.00	0.13	3, MACHINE NO. 605, Anhydrous Applicator (LBS.NH3)
OPERATION NO. 1	1.50	1.91	6, MACHINE NO. 655, Sprayer (QT. ATRAZINE)
OPERATION NO. 1	0.32	67.50	7, MACHINE NO. 220, Planter (fert., herb., etc) (SEED 50LB. BAG)
2	250.00	0.10	(LBS. 16-20-0)
3	8.00	1.49	(LBS. COUNTER 156)

SECTION 14: * * * GENERAL INFORMATION * * *

LINE NO.	DESCRIPTION				
1	COLORADO - UTE PROJECT - SAN JUAN WEST - ZONE A				
2	CORN , GRAIN				
3	OWNED LAND				
	EXPECTED YIELD PER ACRE	AUM GRAZING PER ACRE	TOTAL CROPLAND ACRES	ACRES THIS CROP BUDGET	
4	180.00	2.50	204.00	153.00	
	INTEREST RATE ON OPERATING EXPENSES, %	TIME (MO)	LABOR COST \$/HR	INTEREST RATE ON MACHINE INVESTMENT, %	
5	8.38	6.0	5.00	8.38	
	ESTABLISHMENT CHARGE PER YEAR	MANGEMENT CHARGE/UNIT HARVESTED	VALUE OF GRAZING PER AUM	SELLING PRICE/UNIT HARVESTED	
6	0.0	0.08	10.00	3.17	
	REAL ESTATE TAXES	NO. OF ACRES TAXED	INTEREST RATE ON REAL ESTATE	LAND VALUE \$/ACRE	ACRES FARMED PER ACRE HARVESTED
7	0.0	0.00	0.0	0.0	1.00
8	OVERHEAD CHARGE (%)		5.00		
	COMBINE BASE UNIT FIXED COST FACTOR	COMBINE BASE UNIT REPAIR COST FACTOR			
9	11.60	2.61			
	TRACTOR FIXED COST FACTOR	TRACTOR REPAIR COST FACTOR			
10	12.53	4.04			

001499

San Juan West - Zone A - Corn, Grain Datafile

SECTION 15: * * * TECHNICAL INFORMATION * * *

MACH. NO.	DESCRIPTION	FIXED COST FACTOR % OF LIST	REPAIR COST FACTOR % OF LIST	AVG SPEED	AVG FIELD EFF.
105	Moldboard Plow	9.70	1.91	4.50	80.00
115	Tandem Disc	9.70	1.71	4.00	80.00
220	Planter (fert., herb., etc)	10.60	1.14	4.50	60.00
315	Row Crop Cultivator	10.60	2.19	3.50	80.00
415	Combine, Corn Head	11.40	1.96	2.80	62.50
440	Truck	13.29	3.20	0.0	0.0
605	Anhydrous Applicator	9.70	1.30	4.00	67.50
620	Roller Harrow	9.70	0.25	6.00	85.00
630	Dryer	13.29	5.00	0.0	0.0
655	Sprayer	9.70	0.71	5.00	55.00
715	Irrigation, Side Roll System	0.0	0.0	0.0	0.0

COLORADO - UTE PROJECT - SAN JUAN WEST - ZONE A
SOYBEANS

TOTAL CROPLAND ACRES	204.0	EXPECTED YIELD PER ACRE	45.0
ACRES THIS CROP BUDGET	51.0	ANIMAL UNITS OF GRAZING	0.0

OPERATION	ACRES /HOUR	PURCHASED MATERIALS AMOUNT /ACRE	COST /UNIT	MACHINERY COSTS FUEL AND LUBE	REPAIR AND MAINT.	FIXED	TOTAL COSTS
Tandem Disc	6.90			0.84	1.52	5.82	8.17
Tandem Disc	6.90			0.84	1.52	5.82	8.17
Planter (fert., herb., etc)	5.20			1.11	2.21	11.64	14.96
SOYBEAN SEED (LBS.)		60.00	0.29				17.40
(LBS. N)		20.00	0.28				5.60
(LBS. P205)		40.00	0.27				10.80
(QT. LASSO/TREFLAN)		3.00	5.27				15.81
INNOCULANT (LBS.)		1.00	0.30				0.30
Row Crop Cultivator	5.40			1.07	1.62	5.42	8.11
Row Crop Cultivator	5.40			1.07	1.62	5.42	8.11
Irrigation, Side Roll System							
0.0 IN. APPLIED	0.0 *			0.0	0.0	0.0	0.0
Combine, Grain Head	CUSTOM						26.00
Truck				2.05	0.41	1.64	4.10
Truck				0.72	0.14	0.58	1.44
Truck				0.72	0.14	0.58	1.44
TOTALS				8.40	9.18	36.91	130.41

* - MINUTES OF LABOR/ACRE

CASH COSTS

PURCHASED MATERIALS	49.91
FUEL AND LUBE	8.40
REPAIRS AND MAINTANANCE	9.18
CUSTOM HIRE AND MACHINE RENTAL	26.00
INTEREST ON OPERATING EXPENSE (93.50 X 8.38% FOR 6.0 MONTHS)	3.92
TOTAL CASH COSTS	97.42

LABOR

DIRECT LABOR	5.12
(0.9 HRS X 5.00/HR X 1.2 (OVERHEAD))	
TOTAL CASH COSTS AND LABOR	102.53

FIXED COSTS

FIXED MACHINERY COSTS (INCLUDES INTEREST AT 8.38%)	36.91
REAL ESTATE TAXES	0.0
INTEREST ON LAND (\$ 0.0 VALUE/A X 0.0 % X 0.0)	0.0
TOTAL FIXED COSTS	36.91
TOTAL COST, EXCEPT OVERHEAD AND MGT.	139.45

OVERHEAD AND MANAGEMENT

OVERHEAD (TOTAL CASH COSTS X 5.00%)	4.87
MANAGEMENT CHARGE (\$ 0.19 X ESTIMATED YIELD)	8.55
TOTAL OVERHEAD AND MANAGEMENT	13.42
TOTAL COST PER ACRE	152.87
TOTAL COST PER UNIT OF PRODUCTION (BASED ON ESTIMATED YIELD)	3.40

ESTIMATED RETURNS

ESTIMATED CROP RETURN PER ACRE	319.50
ESTIMATED AUM GRAZING RETURNS	0.0
ESTIMATED TOTAL RETURN PER ACRE	319.50
ESTIMATED NET RETURN PER ACRE	166.63

San Juan West - Zone A - Soybeans Datafile

SECTION 1 : * * * FIELD OPERATIONS * * *

OPERATION NUMBER	MACHINE NUMBER	MACHINE STATUS	DESCRIPTION
1	115	OWNED	Tandem Disc
2	115	OWNED	Tandem Disc
3	220	OWNED	Planter (fert., herb., etc)
4	315	OWNED	Row Crop Cultivator
5	315	OWNED	Row Crop Cultivator
6	715	OWNED	Irrigation, Side Roll System
7	405	CUSTOM	Combine, Grain Head
8	440	OWNED	Truck
9	440	OWNED	Truck
10	440	OWNED	Truck

SECTION 2: * * * TRACTORS * * *

TRACTOR NUMBER	HORSE-POWER	FUEL USE GAL/HR	FUEL PRICE \$/GAL	FUEL TYPE CODE	TOTAL ANNUAL USE (HR)	OWNER-SHIP STATUS	LIST PRICE	MODEL NAME
1	126.00	5.52	0.95	1	255.4	1	47392.00	MF 3545

SECTION 4: * * * OWNED, PULL-TYPE MACHINES * * *

LINE NO.	MACHINE NUMBER	TRACTOR USED	ACRES /HOUR	WIDTH (FT)	TOTAL USE/YR	LIST PRICE
1	115	1	6.90	16.00	408.00	10300.00
2	220	1	5.20	16.00	204.00	13800.00
3	315	1	5.40	16.00	408.00	4300.00
4	315	1	5.40	16.00	408.00	4300.00
5	115	1	6.90	16.00	408.00	10300.00

SECTION 9: * * * TRUCKS * * *

LINE NO.	TRUCK NUMBER	TRUCKING EXPENSE (\$/UNIT HARVESTED)
1	440	0.09
2	440	0.03
3	440	0.03

SECTION 10: * * * IRRIGATION * * *

MACHINE NO. 715, Irrigation, Side Roll System

LABOR MIN/ACRE	FUEL, LUBE \$/ACRE	REPAIRS, MAINT. \$/ACRE	FIXED COST \$/ACRE	WATER APPLIED (IN.)
0.0	0.0	0.0	0.0	0.0

SECTION 11: * * * CUSTOM OPERATIONS * * *

LINE NO.	MACHINE NUMBER	CUSTOM RATE PER ACRE (\$)
1	405	26.00

San Juan West - Zone A - Soybeans Datafile

SECTION 13: * * * PURCHASED MATERIALS * * *

LINE NO.	UNITS /ACRE	COST /UNIT	DESCRIPTION
OPERATION NO. 3, MACHINE NO. 220, Planter (fert., herb., etc)			
1	60.00	0.29	SOYBEAN SEED (LBS.)
2	20.00	0.28	(LBS.N)
3	40.00	0.27	(LBS.P205)
4	3.00	5.27	(QT.LASSO/TREFLAN)
5	1.00	0.30	INNOCULANT(LBS.)

SECTION 14: * * * GENERAL INFORMATION * * *

LINE NO.	DESCRIPTION				
1	COLORADO - UTE PROJECT - SAN JUAN WEST - ZONE A				
2	SOYBEANS				
3	OWNED LAND				
EXPECTED YIELD PER ACRE					
4	45.00	AUM PER ACRE	TOTAL CROPLAND ACRES	ACRES THIS CROP BUDGET	
INTEREST RATE ON OPERATING EXPENSES, %					
5	8.38	TIME (MO)	LABOR COST \$/HR	INTEREST RATE ON MACHINE INVESTMENT, %	
ESTABLISHMENT CHARGE PER YEAR					
6	0.0	MANGEMENT CHARGE/UNIT HARVESTED	VALUE OF GRAZING PER AUM	SELLING PRICE/UNIT HARVESTED	
REAL ESTATE TAXES					
7	0.0	NO. OF ACRES TAXED	INTEREST RATE ON REAL ESTATE	LAND VALUE \$/ACRE	ACRES FARMED PER ACRE HARVESTED
8	OVERHEAD CHARGE (%)		5.00		
COMBINE BASE UNIT FIXED COST FACTOR					
9	11.60	COMBINE BASE UNIT REPAIR COST FACTOR		2.61	
TRACTOR FIXED COST FACTOR					
10	12.53	TRACTOR REPAIR COST FACTOR		4.04	

001583

San Juan West - Zone A - Soybeans Datafile

SECTION 15: * * * TECHNICAL INFORMATION * * *

MACH. NO.	DESCRIPTION	FIXED COST FACTOR % OF LIST	REPAIR COST FACTOR % OF LIST	AVG SPEED	AVG FIELD EFF.
115	Tandem Disc	9.70	1.71	5.00	83.50
220	Planter (fert., herb., etc)	10.60	1.14	4.50	60.00
315	Row Crop Cultivator	10.60	2.19	3.50	80.00
405	Combine, Grain Head	13.09	3.00	2.80	67.50
440	Truck	13.29	3.20	0.0	0.0
715	Irrigation, Side Roll System	0.0	0.0	0.0	0.0