



Bluewater Mill  
Post Office Box 638  
Grants, New Mexico 87020  
Telephone 505 876 2211  
Facsimile 505 876 2772

December 3, 1996

40.8902

Mr. Joseph Holonich, Chief  
High Level Waste and Uranium  
Recovery Project Branch  
Division of Waste Management, NMSS (T7J9)  
11545 Rockville Pike  
Rockville, Maryland 20852

**RE: License No. SUA-1470, Docket No. 40-8902**

Dear Mr. Holonich:

Enclosed please find a cost estimate for remediation of residual Thorium-230 in the soils of the former evaporation ponds. The cost estimate is submitted in accordance with your staff's request during the November 13, 1996 meeting between ARCO, and Mr. Ken Hooks and Ms. Elaine Brummet of your Washington DC staff. The cost estimate is provided for a cost-benefit analysis to determine feasibility of residual Th-230 soil cleanup at the Bluewater Mill Site (Site). The most viable and cost effective alternative considered for cost estimate consists of excavation and placement of soils on the Acid Tailings Pile (ATP), grading to a stable slope, placement of radon barrier and top soil, and vegetation for erosion protection. The estimated cost for this alternative is approximately \$674,000.00.

Assuming an unlikely worse case scenario as discussed in the September 23, 1996 Addendum 1 to the Bluewater Mill Site Reclamation Completion Report, the residual Th-230 in soils would pose a dose of 0.2 mrem per year to a worker during long term surveillance at the Site. Assuming a four person crew working in the area of drainage channel at the Site, and the 1000 year compliance period, the total dose would be less than one person-rem. The \$674,000.00 remedial cost for the residual Th-230 would be equivalent to over \$674,000.00 per person-rem, compared to ALARA criterion of \$1000 per person-rem specified in 10 CFR 50, Appendix I. In addition, the Addendum 1 to the Completion Report also included an estimated dose of 0.3 mrem per year from residual Th-230 to a hypothetical individual member of the public living at the downwind site boundary, which is considered extremely unlikely to occur. For an average lifespan of 70 years, the total dose to an individual would be 0.02 rem. Based on these analysis, ARCO believes that any further remedial actions for residual Th-230 is not justified.

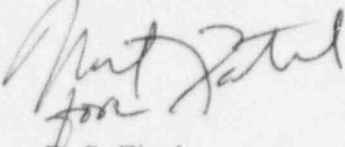
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Mr. Joseph Holonich  
License No. SUA-1470, Docket No. 40-8902  
December 3, 1996  
Page 2

Should you have any questions regarding this submittal, please do not hesitate to contact me at (406) 563-5211, ext. 418, or Mr. Natver Patel of AVM Environmental Services, Inc. at (505) 287-4593.

Sincerely,

A handwritten signature in dark ink, appearing to read "Nat Patel" with a stylized flourish underneath.

R. S. Ziegler  
Operations Manager

Enclosure

pc: J. Virgona, USDOE  
C. Cains, USNRC, Region IV  
N. Brody, ARCO  
N. Patel, AVM  
C. Sanchez, AECI

ANDERSON Engineering Company, Inc.  
920 Lobo Canyon Rd, Suite 5-B  
Grants, New Mexico 87020  
BUS (505) 285-6484  
FAX (505) 285-6389

Construction Managers  
Reclamation Design  
Civil Engineers

December 2, 1996

Natver Patel  
AVM Environmental Services, Inc.  
1717 Del Norte  
Grants, New Mexico 87020

Dear Natver:

Attached please find the cost estimate for reclamation treatment of areas containing Th-230 concentrations of concern in the evaporation pond area. The cost estimate considers two options of reclamation for the evaporation pond area and the general assumptions are as follows:

Option One - Removal

- Removal of Th-230 contaminated soils to a depth of 2 - 3 feet
- Transport of contaminated soils to the old acid tailings
- Placement of contaminated soils on top surface of old acid tailings
- Grade placed contaminated soils to stable slope geometry
- Place radon barrier
- Place topsoil
- Place rock erosion protection on 5:1 out slopes
- Blend evaporation pond excavated areas
- Revegetate old acid tailings and grade excavation areas

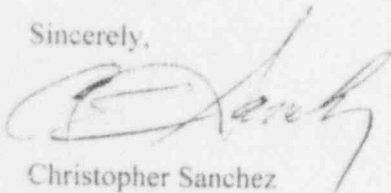
Option Two- Stabilization In Place

- Grade top surface of contaminated soils in evaporation pond area
- Place radon barrier
- Place rock erosion protection over all capped areas
- Revegetate disturbed areas

The cost of Option One is approximately \$0.67M. The cost of Option Two is approximately \$1.6M. The difference in costs is attributed mainly to the cost of the erosion protection rock used to cover radon barrier in the evaporation pond areas.

Should you have any questions, please contact me to go over this estimate.

Sincerely,



Christopher Sanchez  
Project Manager - Anderson Engineering Company, Inc.

Attachment

pc: RSZ

ATLANTIC RICHFIELD CO.  
BLUEWATER MILL  
COST ESTIMATE

Project : Reclamation Treatment Th230 Cost Estimate

Area: Bluewater Millsite Evaporation Ponds

By: CES

Date: 11/26/96

Client: ARCO

Rep: R.S. Ziegler

**Solve:**

Provide a rough cost estimate for reclamation options for areas containing Th230 soil concentrations considered a problem by NRC.

**Assumptions**

- 1) Th230 sampling conducted at Bluewater Mill
- 2) Map of Th230 sample location and concentrations dated Aug 1996
- 3) Treatment for areas 15 pCi/g or greater
- 4) Treatment Option 1 - Removal of contaminated soil to a depth of 2-3 ft., Transport to the Old Acid tails, Place on Old Acid tails top surface, Grade to Stable Slope, Place Radon Barrier, Rock 5:1 out slopes, Blend evap excavation areas, Reveg
- 5) Treatment Option 2 - Stabilization in place, Grade for Radon Barrier, Place Radon Barrier, Place rock erosion protection over capped areas

**Calculations:**

**OPTION 1**

Th230 Areas - Removal Depth vs Th Reduction

Area Description	T1 Th230 Con	T2 Th230 Con	Th230 Reduction	Depth of Cut	Reduction/Ft
1	21.4	1.9	19.5	6000-5998=2'	9.75
2	19.3	0.5	18.8	5998-5995=3'	6.27
3	17.3	6.6	10.7	6587-6584=3'	3.57
4	79.9	1.3	78.6	6586-6582=4'	19.65

Average Reduction

31.9

Average Cut

3.00

**Volume**

Use Reduction/ft for cut on evap ponds to remove Th contaminated soil

Area Description	Area Inches	Area SqFt	Cut	Volume CY
1 North AOC	1.71	153900.00	2.00	11400.00
2 Center AOC	12.25	1102500.00	3.00	122500.00
3 South AOC	0.553	49770.00	3.00	5530.00
		1306170.00		139430.00

29.98553719

Area available on Old Acid Tails=

10.101 ac

Solve for Depth  $10.101(43560)/(d)/27=139430$

$d=139430/(27/10.101 \times 43560)$

$d=8.556$  ft

**Cover and Topsoil**

Area Description	Area SqFt	Depth	Volume CY
Radon Barrier	440000	1.5	24444.44
Top Soil	440000	1.0	16296.30
			40740.74

**Materials Movement - Remove Soil from Evap Pond Areas**

Using Cat Performance Handbook

Haul Distance 6000 ft

Round Trip: 12000 ft

Assume: 631 scraper 25 cy Cap

Cycle Time: Load 0.6 Min

Haul 3.6 Min 19 mph

Spread 0.7 Min

Return 3 Min 23 mph

7.9 Min/Haul Cycle

Efficiency 83% (60)  $83/7.9(25)=$  158 Cy/hr/unit

Compact

Assume:

825 Sheeps Foot Compactor

Passes 4@5mph

ATLANTIC RICHFIELD CO.  
BLUEWATER MILL  
COST ESTIMATE

Efficiency: 83% 1083( 83)= 898.89 1 compacter

Materials Movement - Cover and Topsoil

Using Cat Performance Handbook

Haul Distance 9000 ft

Round Trip: 18000 ft

Assume : 631 scraper 25 cy Cap

Cycle Time: Load 0.6 Min  
Haul 5.1 Min 20 mph  
Spread 0.7 Min  
Return 4.4 Min 24 mph  
10.8 Min/Haul Cycle

Efficiency: 83% (60) 83/10.8(31)= 143 lcy/hr/unit

Compact Same as Cont Soil Placement

Materials Movement - Rock Cover

Purchase D50=1/2" Filter 10.53/cy  
D50=2 1/2" Rock Cover 8.29/cy  
Delivery to work site 0.15/cy/mi

Quantity Slope  $(8.55^2 + 25.65^2) = S^2 \cdot 1/2$   
S=28.36'  
L=2650'

(28.36)2650(1)= 2783.48 cy @ 30mi = 83504.44

1392cy Filter

1392cy Rock

Production 110cy/hr delivery w/ 5 Highway Haul Trucks from Supplier  
2783.48/(110)8= 3.16 Days 25.28 Hrs

Size Fleet

898/158= 5.6 Say 5 scrapers  
139430/158(5)= 176.49 hrs 22.06125 Days for soil placement  
40741/143(5)= 56.98 Hrs 7.1225 Days for Ra Barrier& topsoil

Period

Total 22.061+7.12+3.16 32.34 Days  
32.34/20= 1.617 Months

Cost Summary - Option 1

Number	Unit	Unit Cost	Hours/Quantity	Cost
	Mobilization @8%			\$ 37,339.00
5	631 Scraper (hr)	166.90	233	\$ 183,165.06
1	D-9 w/ ripper	144.90	259	\$ 37,494.32
1	D-8	124.00	233	\$ 28,951.52
1	825 Compacter	121.90	205	\$ 24,987.06
2	10,000 gal water Wagon	123.20	233	\$ 57,529.47
1	14G Grader	83.80	259	\$ 21,684.09
1	Fuel/lub truck	35.70	259	\$ 9,237.73
1	Forman	39.50	259	\$ 10,221.02
2	Mechanics	26.90	259	\$ 13,921.29
2	Survey Crew	62.90	129	\$ 16,276.00
2	Pickup	6.60	259	\$ 3,415.63
	Rock Transport To Site (cym)	0.15	83504	\$ 12,525.60
	Rock Purchase D50=1/2 (cy)	16	1392	\$ 22,272.00
	Rock Purchase D50=2.5 (cy)	18	1392	\$ 25,056.00
	Revegetation (ac)	40	600	\$ 24,000.00
				<u>\$ 528,075.80</u>
	Contingency	@20%		\$ 633,690.96
	NMGRT	@6.3125%		\$ 673,692.70

ATLANTIC RICHFIELD CO.  
BLUEWATER MILL  
COST ESTIMATE

Calculations:

OPTION 2  
Volume  
Land Shaping and Grading of Areas

Area Description	Area Inches	Area SqFt	Grading	Volume CY
1 North AOC	1.71	153900.00	1.00	5700.00
2 Center AOC	12.25	1102500.00	0.75	30625.00
3 South AOC	0.553	49770.00	1.00	1843.33
		1306170.00		38168.33

Radon Barrier Cover and Topsoil

Area Description	Area Sq In	Area Sq Ft	Depth	Volume CY
Radon Barrier				
1 North AOC	1.71	153900.00	1.50	8550.00
2 Center AOC	12.25	1102500.00	1.50	61250.00
3 South AOC	0.553	49770.00	1.50	2765.00
Total				72565.00

Materials Movement - Place Radon Barrier  
Using Cat Performance Handbook

Haul Distance: 6000 ft  
Round Trip: 12000 ft  
Assume: 631 scraper 25 cy Cap  
Cycle Time: Load 0.6 Min  
Haul 3.6 Min 19 mph  
Spread 0.7 Min  
Return 3 Min 23 mph  
7.9 Min/Haul Cycle  
Efficiency: 83% (60/7.9(25)= 158Cy/hr/unit

Compact  
Assume: 825 Sheeps Foot Compacter  
Passes: 4@6mph  
Efficiency: 83% 1083(.83)= 898.89 1 compacter

Materials Movement - Rock Cover

Purchase D50=1/2" Filter 16.00/cy  
D50=21/2" Rock Cover 12.00/cy  
Delivery to work site 0.15/cy/mi

Quantity	Area Description	Area Sqin	Area Sq Ft
	1 North AOC	1.71	153900
	2 Center AOC	12.25	1102500
	3 South AOC	0.553	49770
	Total		1306170
	Acres		30

(1306170)(1)/27= 48376.67 cy @ 30mi = 1451300.00  
24188.33 cy Filter  
24188.33 cy Rock

Production 220cy/hr delivery w/ 10 Highway Haul Trucks from Supplier  
48376.7/(220)8= 27.49 Days 220 hrs

Size Fleet

ATLANTIC RICHFIELD CO.  
BLUEWATER MILL  
COST ESTIMATE

Grade	38168/290=	131.61 hrs	16.45
No. Scrapers	898/158=	5.6 Say 5 scrapers	
Radon	72565/158(5)=	91.85 hrs	11.48
Rock		220.00 hrs	27.50 Days
Period			38.98 Days
Total		16.45+11.48=	27.93 Days
		27.5+38.98/20=	1.95 Months

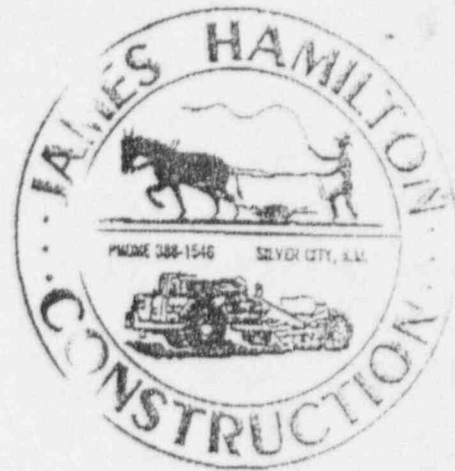
Cost Summary - Option 2

Number	Unit	Unit Cost	Hours/Quantity	Cost
	Mobilization @8%			\$ 37,339.00
5	631 Scraper (hr)	156.90	92	\$ 72,174.00
1	D-9 w/ ripper	144.90	202	\$ 29,269.80
1	D-8	124.00	202	\$ 25,048.00
1	825 Compacter	121.90	92	\$ 11,214.80
2	10,000 gal water Wagon	123.20	268	\$ 66,035.20
1	14G Grader	83.80	334	\$ 27,989.20
1	Fuel/lub truck	35.70	334	\$ 11,923.80
1	Forman	39.50	334	\$ 13,193.00
2	Mechanics	26.90	334	\$ 17,969.20
2	Survey Crew	62.90	167	\$ 21,008.60
2	Pickup	8.60	334	\$ 4,408.80
	Rock Transport To Site (cym)	0.15	1451300	\$ 217,695.00
	Rock Purchase D50=1/2 (cy)	12	24188	\$ 290,260.00
	Rock Purchase D50=2.5 (cy)	16	24188	\$ 387,013.33
	Revegetation (ac)	15	600	\$ 9,000.00
				\$ 1,241,541.73
	Contingency	@20%		\$ 1,489,850.08
	NMGRT	@6.3125%		\$ 1,583,896.87

05-001

May 22, 1996

Christopher Sanchez  
ANDERSON ENGINEERING  
920 Lobo Canyon Road, Suite 5-B  
Grants, New Mexico 87020  
c/o ARCO  
Butte, Montana



\* \* \* Letter Sent Via Fax to (406) 563-8269

RE: Reclaimed ARCO Bluewater Uranium Mill Site

Dear Mr. Sanchez:

In keeping with your request, enclosed please find Labor and Equipment Rates for repair work at the above referenced project site.

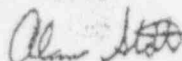
We plan on designating Walt Brown as Project Manager for this work. He served as the Field Superintendent for Contract No. NMO-9345 and he is very familiar with the project site and your operating procedures.

Please note the labor rates do include the necessary per diem to keep qualified personnel on site for a short term basis.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

JAMES HAMILTON CONSTRUCTION CO.

  
By: Alan Stott  
Its: Estimator

ab

xc: File, Job

## LABOR RATES

The following labor and equipment rates are "wrap around" or all inclusive, including but not limited to: payroll, taxes, benefits, any other labor burden, small tools under \$500.00 in value and consumables, except as noted, all overhead and profit.

<u>CRAFT &amp; CLASSIFICATION</u>	<u>STRAIGHT TIME</u> <u>HOURLY RATE</u>	<u>OVERTIME</u> <u>HOURLY RATE</u>
<b>OPERATORS (HEAVY EQUIPMENT):</b>		
<b>GROUP I JOURNEYMEN</b> Farm Tractor, Power Broom, Forklift, Pneumatic Roller	25.20	37.80
<b>GROUP II JOURNEYMEN</b> Bulldozer, Backhoe, Loader 2-10, Laydown Machine, Curb Machine, Motor Grader I, Crane 6-30 Ton, Concrete Saw, Concrete Pump, Screedman, Water Wagon 10 MGal., Driller, Steelwheel Roller, Sheepsfoot, Fusing Machine, Asphalt Distributor, Chain Trencher, Boom Truck 6 - 18 Ton, Scraper, Rock Saw	26.90	40.35
<b>GROUP III JOURNEYMEN</b> Motor Grader Finish, Crane 30 Ton-Over, Screen Plant, Crusher, Bulldozer - D10, Loader 10 - OV, Excavator w/Impact Breaker	27.80	41.70
<b>TRUCK DRIVERS (LIGHT EQUIPMENT):</b>		
<b>GROUP I JOURNEYMEN</b> Flat Bed Truck, Steam Cleaning Truck, Van Truck, Personnel Bus	22.70	34.05
<b>GROUP II JOURNEYMEN</b> Dump Truck 10-18, 40' Float, Bottom Dump, Water Truck 1-6 MGal., Tire Truck	24.40	36.60
<b>GROUP III JOURNEYMEN</b> Transport, End Dump	27.80	41.70
<b>LABORERS:</b>		
<b>GROUP I LABORERS</b> Unskilled Laborers, Flagperson, Clerical Helper	17.10	25.65
<b>GROUP II LABORERS</b> Jackhammer, Tamper Operator, Striping Machine, Tailings Dam Maintenance	18.40	27.60
<b>GROUP III LABORERS</b> Asphalt Raker, Grade Setter, Driller Helper, Draftsman Helper, Powderman, Threading Machine, Pipelayer, Sandblaster, Hammer Drill	19.80	29.70

## LABOR RATES

<u>CRAFT &amp; CLASSIFICATION</u>	<u>STRAIGHT-TIME HOURLY RATE</u>	<u>OVERTIME HOURLY RATE</u>
PROJECT MANAGER:		
SUPERINTENDENT:	56.10	79.20
FOREMAN:	47.80	67.00
	39.50	54.90
WELDERS:		
Helpers	21.60	31.00
CARPENTERS:		
Journeymen	27.80	39.30
Helpers	21.60	31.00
Cement Finishers	27.80	39.30
Ironworker (Reinforcing)	27.80	39.30
OILERS:		
Head Oiler	26.90	38.10
Oiler Helper	21.60	31.00
OTHER:		
Draftsman		
Painter	30.40	43.10
Blaster	27.80	39.30
Journeymen Welder w/Truck & Welder plus Oxygen, Acetylene, & Rod	27.80	39.30
Heavy Equipment Mechanic w/Truck and Tools	54.00	68.00
3-Man Survey Crew w/Truck, Instruments, and Materials	52.00	66.00
2-Man Survey Crew w/Truck, Instruments, and Materials	80.00	107.50
	62.90	83.20

ALL REQUIRED TRAINING WILL BE BILLED AT THE APPROPRIATE LABOR CLASSIFICATION WHILE EMPLOYEE IS IN TRAINING.

"WRAP AROUND" LABOR RATES DO NOT INCLUDE ANY SAFETY EQUIPMENT, TOOLS, OR CLOTHING WHICH ARE SPECIALIZED IN NATURE.

PER DIEM IS INCLUDED IN THE "WRAP AROUND" LABOR RATE.

ALL RATES PLUS APPLICABLE SALES TAXES.

# EQUIPMENT RATES OPERATED, SERVICED AND MAINTAINED

DESCRIPTION	STRAIGHT-TIME HOURLY RATE	OVERTIME HOURLY RATE
TRACTORS:		
JD 450 W/DOZER		
JD 550 W/DOZER	76.00	111.00
CAT D6 W/DOZER & MULTISHANK RIPPER	1.00	65.00
CAT D6 L.G.P. W/DOZER	12.90	94.10
CAT 824 RUBBER TIRES W/DOZER	82.90	94.10
CAT D8 W/DOZER & MULTISHANK RIPPER	113.90	115.10
CAT D9 W/PUSH BLOCK	1.00	135.00
CAT D9 W/DOZER & MULTISHANK RIPPER	3.40	144.00
CAT D10 W/DOZER & MULTISHANK RIPPER	4.90	155.10
	.80	255.00
MOTOR GRADERS:		
CAT NO. 130 W/14' MOLD BOARD, RIPPER & SCARIFIER	65.80	78.30
CAT NO. 12 W/14' MOLD BOARD, RIPPER & SCARIFIER	5.80	80.00
CAT NO. 140 W/14' MOLD BOARD, RIPPER & SCARIFIER	11.80	83.00
CAT NO. 14 W/14' MOLD BOARD, RIPPER & SCARIFIER	3.80	95.00
CAT NO. 16 W/16' MOLD BOARD, RIPPER & SCARIFIER	5.90	125.40
LOADERS:		
CASE 480, 3/4 - 1 C.Y.		
SKID LOADER, 1,225 - 1,350 LBS	9.80	51.00
CAT 950, 3 - 3 1/2 C.Y.	39.30	50.50
CAT 966, 3 1/2 - 4 1/2 C.Y.	13.40	75.00
CAT 970, 4 1/2 - 5 C.Y.	9.90	51.10
CAT 980, 5 - 6 C.Y.	16.90	58.10
CAT 988, 7 - 8 C.Y.	16.90	108.10
CAT 992, 12 - 13 C.Y.	131.90	143.10
	32.80	244.00
SCRAPERS:		
CAT 613 ELEVATING SCRAPER, 11 C.Y.		
CAT 623 ELEVATING SCRAPER, 23 C.Y.	96.30	107.50
CAT 631 STANDARD SCRAPER, 21 - 31 C.Y.	145.20	158.40
	56.90	168.10

# **EQUIPMENT RATES OPERATED, SERVICED AND MAINTAINED**

<u>DESCRIPTION</u>	<u>STRAIGHT-TIME HOURLY RATE</u>	<u>OVERTIME HOURLY RATE</u>
<b>END DUMPS:</b>		
CAT 773, 50 TON	32.80	44.30
CAT 777, 85 TON	169.80	261.30
<b>COMPACTORS/ROLLERS:</b>		
CAT 825 COMPACTOR W/DOZER	21.90	27.70
PNEUMATIC ROLLER, 8-15 TON	49.70	62.10
PNEUMATIC ROLLER, 25 - 35 TON	63.30	78.70
PNEUMATIC ROLLER, 50 TON	73.40	89.80
STEELWHEEL ROLLER, 2 TO 5 TON, DOUBLE DRUM	42.70	53.50
VIBRATORY STEELWHEEL ROLLER, SINGLE DRUM	32.60	40.70
VIBRATORY STEELWHEEL ROLLER, DOUBLE DRUM	79.70	99.90
VIBRATORY SHEEPSFOOT ROLLER, SINGLE DRUM	34.60	42.80
MANUALLY GUIDED VIBRATORY COMPACTOR	31.20	39.10
HAND HELD TURTLE TAMPER	28.40	35.30
<b>WATER TRUCKS/PUMPS</b>		
WATER TRUCK W/ SPRAY BARS, 1500-2500 GAL.	45.90	56.30
WATER TRUCK W/ SPRAY BARS, 2500-4500 GAL.	64.90	80.40
WATER WAGON PULLED BY TEREX S-24, 10000 GAL.	23.20	28.40
TRUCK TRACTOR W/WATER TRANSPORT, 7000 GAL.	76.20	94.30
WATER PUMP, 3-IN. PORTABLE W/40 - FT. HOSE	10.10	12.40
WATER PUMP, 6-IN. PORTABLE	17.40	21.40
WATER PUMP, 12-IN. PORTABLE PUMPMaster	17.40	21.40
<b>EXCAVATORS/BACKHOES:</b>		
CAT 416 BACKHOE W/LOADER BUCKET	47.00	58.30
JD 500 / 510 OR CAT 436 BACKHOE W/LOADER BUCKET	52.30	63.60
JD 710 OR CAT 446 BACKHOE W/LOADER BUCKET	62.50	73.70
CAT EL300 HYDRAULIC EXCAVATOR, TRACK MOUNTED	99.40	119.80
7,500 FT. - LB. CLASS IMPACT BREAKER FOR CAT EL300	47.50	N/A
CAT 235 HYDRAULIC EXCAVATOR, TRACK MOUNTED	136.10	147.30

# **EQUIPMENT RATES** **OPERATED, SERVICED AND MAINTAINED**

<u>DESCRIPTION</u>	<u>STRAIGHT TIME HOURLY RATE</u>	<u>OVERTIME HOURLY RATE</u>
<b>CRANES/FORKLIFTS:</b>		
HYDRAULIC CRANE, 12-18 TON	53.30	94.50
HYDRAULIC BOOM TRUCK, 11 - 16 TON	64.70	75.90
STRAIGHT MAST FORKLIFT, 4000 - 6000 LBS.	19.70	60.10
<b>DRILL RIGS/AIR COMPRESSORS/JACKHAMMERS:</b>		
REED SK35 ROTARY DRILL RIG, TRUCK MOUNTED, 6 3/4" DIAMETER HOLE PLUS DRILL STEELS AND BITS COST	166.40	177.60
AIR TRACK DRILL, 2"-3" DIAMETER HOLE PLUS BIT COSTS	85.20	96.40
HYDRAULIC DRILL RIG, TRACK MOUNTED, 2"-4" DIAMETER HOLE PLUS DRILL STEELS, COUPLERS, AND BITS COST	125.50	136.70
AIR COMPRESSOR, 750 - 900 CFM	40.30	N/A
AIR COMPRESSOR, 185 CFM	17.10	N/A
JACKHAMMER PLUS BIT COSTS	1.70	N/A
<b>DUMPTRUCKS/TRANSPORTS/FLATBEDS/MISC. TRUCKS:</b>		
DUMPTRUCK, 12 - 18 C.Y.	57.90	67.50
TRUCK TRACTOR	61.80	71.70
TRUCK TRACTOR W/20 C.Y. BOTTOM DUMP TRAILER	68.40	78.30
TRUCK TRACTOR W/25-30 C.Y. BOTTOM DUMP TRAILER	75.00	84.90
TRUCK TRACTOR W/40-FT. FLOAT	65.40	75.30
TRUCK TRACTOR W/35-50 TON TRANSPORT TRAILER	86.70	98.20
TRUCK TRACTOR W/60-75 TON TRANSPORT TRAILER	97.80	109.30
FLATBED TRUCK, 1 TON	35.70	44.50
FLATBED TRUCK, 2 1/2 TON	43.50	52.60
PERSONNEL BUS	35.70	44.30
STEAM CLEANING TRUCK	44.50	53.60
PICKUP TRUCK	6.60	N/A
UTILITY TRAILER, GOOSENECK/5TH WHEEL	2.60	N/A
<b>MISCELLANEOUS/TOOLS/ETC.:</b>		
WHEEL MOUNTED CHAIN TRENCHER - DITCH WITCH 3610	42.40	53.60
WHEEL MOUNTED ROCK SAW - DITCH WITCH 6510	50.40	61.60
CONCRETE SAW, 14" - 24" (BLADE EXTRA)	43.40	54.60
HYDROCUTTER CONCRETE SAW (CHAIN EXTRA)	43.40	54.60
POWER BROOM	46.20	56.60

# EQUIPMENT RATES OPERATED, SERVICED AND MAINTAINED

DESCRIPTION	STRAIGHT-TIME HOURLY RATE	OVERTIME HOURLY RATE
FUSING MACHINES/GENERATOR SETS/LIGHTS:		
HYDRAULIC FUSING MACHINE, 2" - 6"	52.20	63.40
HYDRAULIC FUSING MACHINE, 6" - 18"	67.60	78.80
GENERATOR SET, 5 KW - 8 KW	6.60	N/A
GENERATOR SET, 10 KW - 20 KW	8.80	N/A
GENERATOR SET, 35 KW - 60 KW	16.50	N/A
GENERATOR SET, 75 KW - 100 KW	22.00	N/A
GENERATOR SET, 150 KW - 175 KW	30.80	N/A
PORTABLE LIGHT TOWER	15.30	N/A
FARMING & SEEDING EQUIPMENT:		
FARM TRACTOR, 50 - 60 HP	36.50	46.90
FARM TRACTOR, 125 - 150 HP	45.40	55.80
DISK 24" PULL TYPE	8.60	N/A
DISK 36" PULL TYPE	12.40	N/A
ROTARY MOWER, REAR MOUNTED, PTO POWERED	5.10	N/A
AUGER FOR TRACTOR MOUNTING	2.20	N/A
CRIMP DISK	10.00	N/A
MULCHER ON UTILITY TRAILER, 35 H.P.	21.60	N/A
RANGE SEED DRILL	16.70	N/A
CYCLONE SPREADER	12.40	N/A

All Equipment must be operated by James Hamilton Construction Co.'s Employee to meet insurance requirements.  
For use on the project only.

All mobilization and demobilization will be at the actual equipment or transport rental rates.

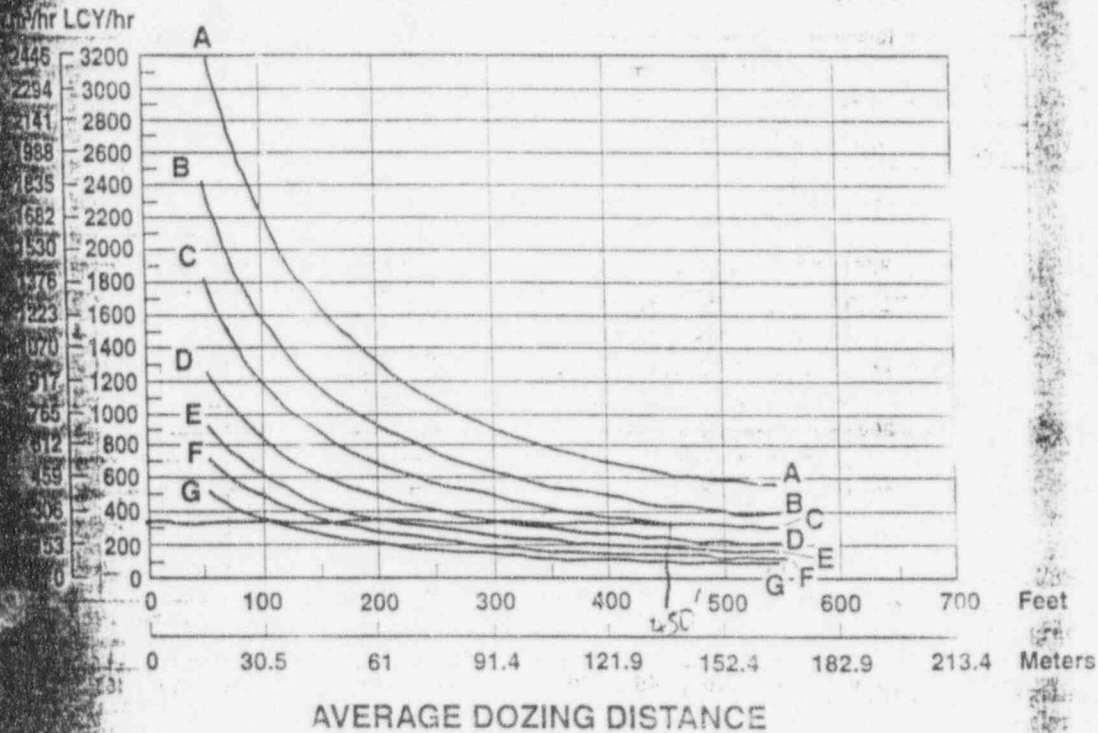
Equipment designated with an N/A in the overtime hourly rate column indicate the hourly rate quoted in the straight-time hourly rate column is for an unoperated equipment rental rate.

ALL RATES PLUS APPLICABLE SALES TAXES.

# Estimating Production Off-The-Job • SU-Blades

Bulldozers

ESTIMATED DOZING PRODUCTION • Semi-Universal Blades • D5H through D11N



LCY/hr ~ 350 CY  
@ .83 EFF 290.5 LCY/hr

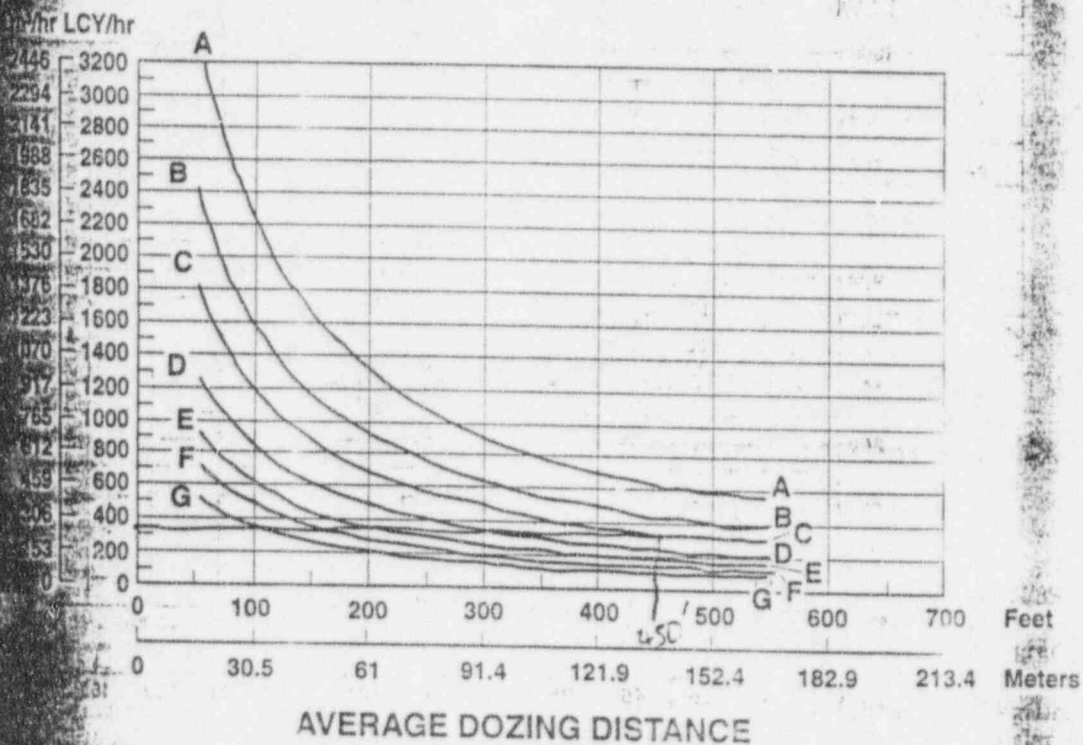
NOTE: This chart is based on numerous field studies made under varying job conditions. Refer to correction factors following these charts.

D11N SU A  
D10N10SU B  
D9H SU C  
D8H SU D  
D7H SU E  
D6H SU F  
D5H XL5SU XL G

# Estimating Production Off-The-Job • SU-Blades

Bulldozers

ESTIMATED DOZING PRODUCTION • Semi-Universal Blades • D5H through D11N

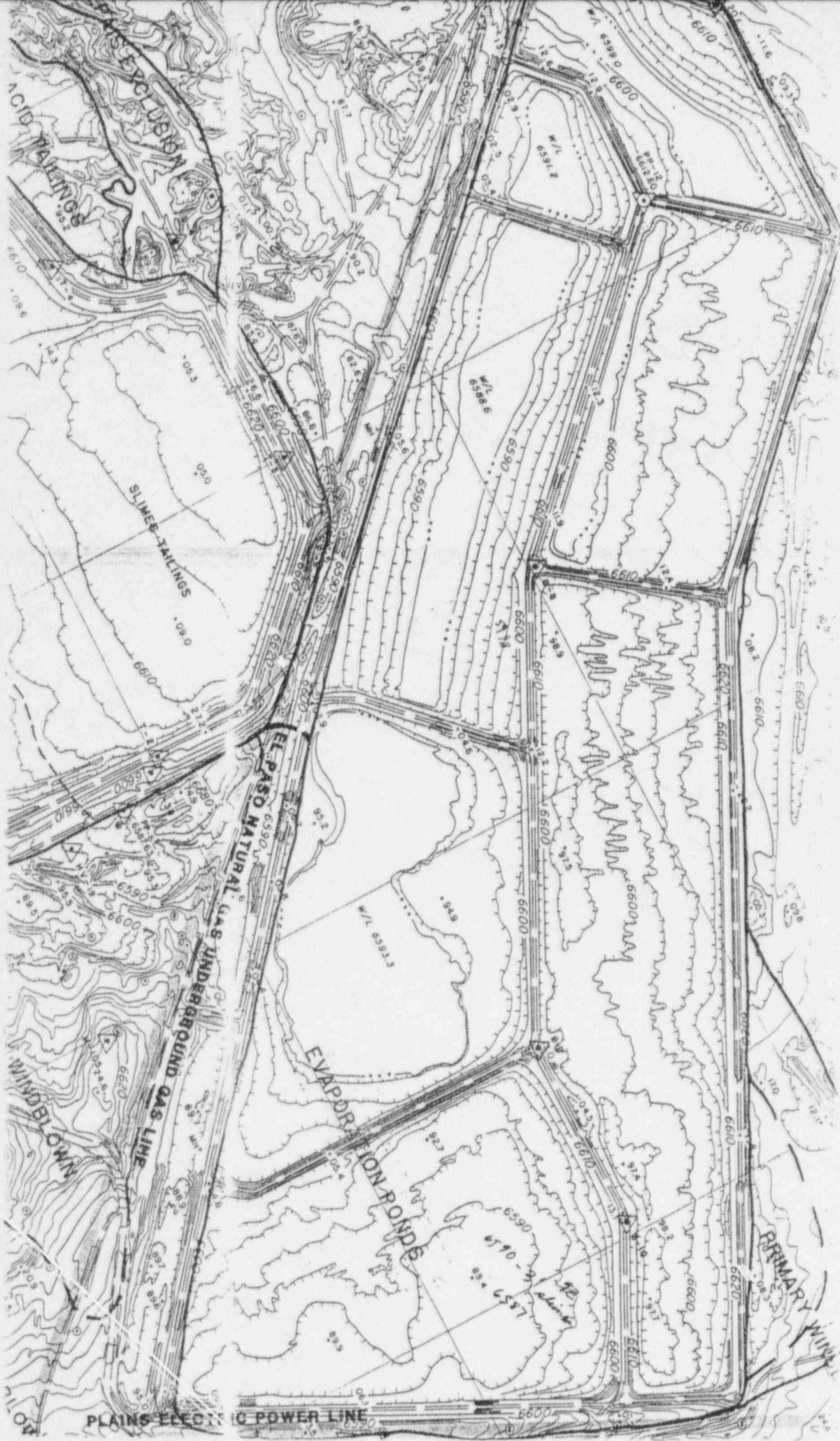


LCY/HR ~ 350 CY

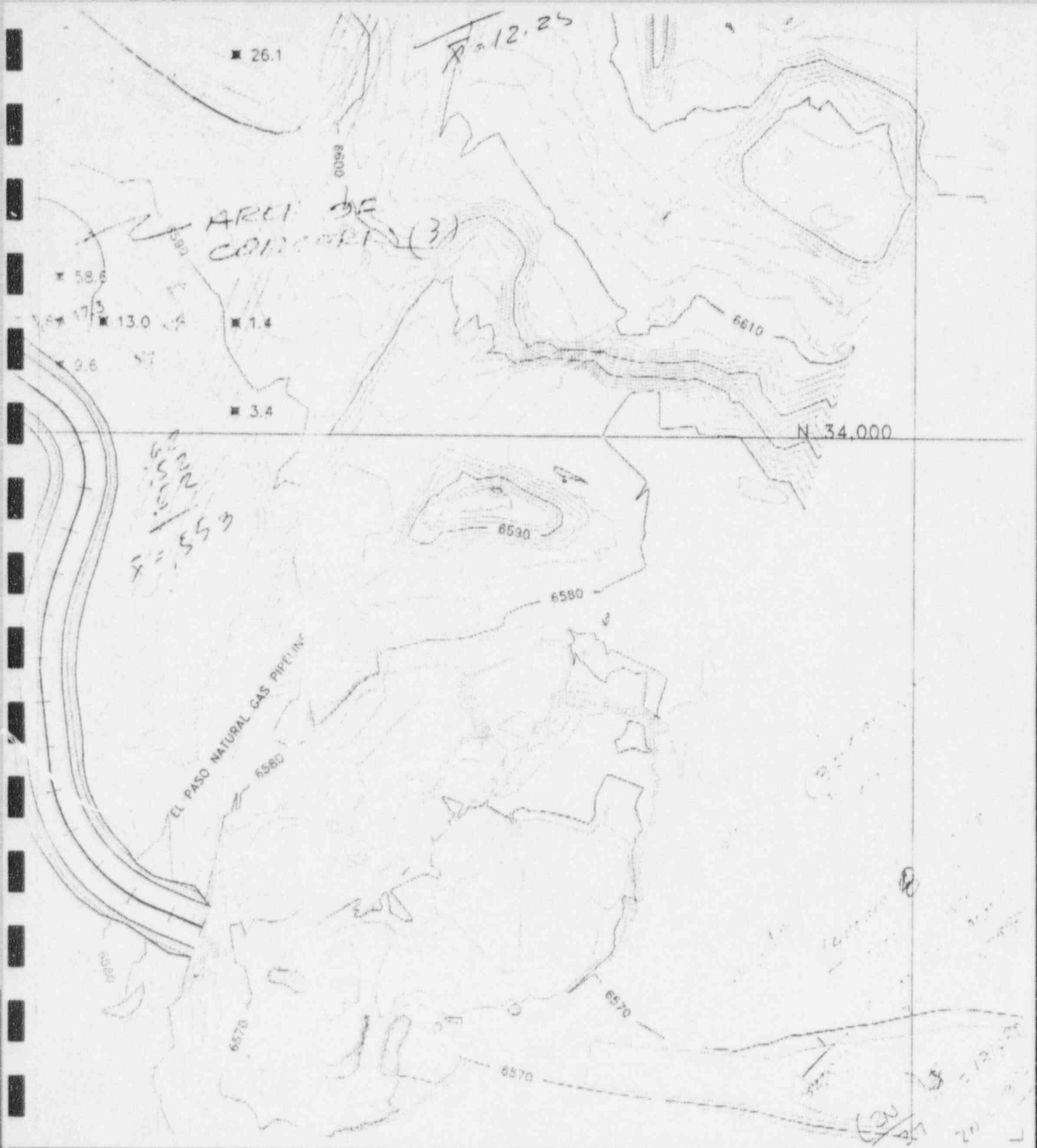
@ .83 EFF 290.5 LCY/HR

NOTE: This chart is based on numerous field studies made under varying job conditions. Refer to correction factors following these charts.

- D11N SU A
- D10N SU B
- D9N SU C
- D8N SU D
- D7N SU E
- D6N SU F
- D5N SU G







ATLANTIC RICHFIELD COMPANY  
BLUEWATER MILL  
NEW MEXICO



ANDERSON ENGINEERING CO., INC.  
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Salt Lake City, UT 84119  
Tel. (801) 972-6222

## EVAPORATION POND AREA Th-230 Sample Locations

BLUEWATER URANIUM MILL COMPLETION REPORT  
August 1996

References:

eptopo.dwg  
th230\_new.dwg

FIG AD1-2

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TH-230.DWG  
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