COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

May 9, 2014

Mr. Michael Clark
Natural Soda, Inc.
3200 RBC 31
Rifle, CO 81650

Re: Nahcolite Project, Permit No. M-1983-194, Technical Revision Approval, Revision No. TR-35

Dear Mr. Clark

On May 9, 2014 the Division of Reclamation, Mining and Safety (Division) approved the Technical Revision application submitted to the Division on April 9, 2014, addressing the following:

- *Addition of three production well pairs, two water supply wells and 23 core/monitoring wells*

The terms of the Technical Revision No. 35 are approved by the Division are hereby incorporated into Permit No. M-1983-194. All other conditions and requirements of Permit No. M-1983-194 remain in full force and effect.

The estimated financial warranty amount of $2,852,945.66 exceeds the currently held amount of $2,037,250.00. An additional financial warranty amount of $815,695.66 is required to be placed with the Division before any of the approved activities can begin. If you have any questions regarding the placement of the required additional financial warranty please contact Barbara Coria at 303.866.3567 extension 8148.

If you have any other questions regarding this permit activity please contact me at 970.241.2042.

Sincerely,

Travis Marshall
Environmental Protection Specialist

Enclosure - Reclamation Cost Estimate

cc: Paul Daggett
BLM - WRFO
220 East Market Street
Meeker, CO 81641

Gerald Daub
Daub & Associates, Inc
1985 ½ South Broadway
Grand Junction, CO 81507

COST SUMMARY WORK

Task description: **TR-35 Final Reclamation Cost Estimate**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: M194-001
User: THM

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Demo. of NSI Plant, Pipelines and Powerlines	DEMOLISH	1	80.00	$530,207.68
02a	Borehole P&A	BOREHOLE	1	460.00	$1,417,767.89
03a	Re-grade Process Ponds	DOZER	2	141.43	$56,045.00
04a	Re-grade Plant Area	DOZER	2	41.97	$16,632.39
05a	Re-grade Well Pads	DOZER	2	100.17	$39,693.04
06a	Distribute 6" of topsoil over 8 acre process pond area	DOZER	2	5.92	$2,345.73
07a	Distribute 6" topsoil over 6.2 acre process area	DOZER	2	4.59	$1,817.55
08a	Replace topsoil over re-graded well pads and access roads	DOZER	2	25.45	$10,083.06
09a	Rip compacted areas	RIPPER	2	14.08	$5,945.00
10a	Distribute 6" topsoil over18.7 acres of decompacted area	DOZER	2	10.27	$4,070.86
11a	Revegetate 44.9 acres	REVEGE	1	73.76	$136,105.34
12a	Mobilization	MOBILIZE	1	8.00	$6,399.36
			SUBTOTALS:	**965.64**	**$2,227,112.90**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02%	Total =	$44,987.68
Performance bond:	1.05%	Total =	$23,384.69
Job superintendent:	482.82 hrs	Total =	$31,581.26
Profit:	10.00%	Total =	$222,711.29
		TOTAL O & P =	$322,664.92
		CONTRACT AMOUNT (direct + O & P) =	$2,549,777.82

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	500.00	Total =	500.00
Engineering work and/or contract/bid preparation:	4.25%	Total =	$108,365.56
Reclamation management and/or administration:	5.00%		$127,488.89
CONTINGENCY:	3.00	Total =	$66,813.39
		TOTAL INDIRECT COST =	$625,832.76
		TOTAL BOND AMOUNT (direct + indirect) =	**$2,852,945.66**

BOREHOLE SEALING WORK

Task description: **Borehole P&A**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 02A State: Colorado Abbreviation: None
Date: 4/16/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

UNIT COSTS

Borehole Description	Sealing/Item Method	Diameter	Length	Quantity	Unit	Unit Cost	Total Cost
3M-TDR	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1876	1,876.00	LF	$7.82	$14,665.44
89-1	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1627	1,627.00	LF	$7.82	$12,718.91
89-2	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1417	1,417.00	LF	$7.82	$11,077.26
89-3	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	347	347.00	LF	$7.82	$2,712.64
90-1	Portland cement grout - 10 in. (labor, equip, materials)	9.625"	1417	1,417.00	LF	$17.84	$25,284.95
90-3	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1627	1,627.00	LF	$7.82	$12,718.91
90-4	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1417	1,417.00	LF	$7.82	$11,077.26
94-1M	Portland cement grout - 6 in. (labor, equip, materials)	5"	2200	2,200.00	LF	$10.92	$24,025.54
BG-1	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1627	1,627.00	LF	$7.82	$12,718.91
BG-4	Portland cement grout - 4 in. (labor, equip, materials)	4.5	1627	1,627.00	LF	$7.82	$12,718.91
DS-2	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1876	1,876.00	LF	$7.82	$14,665.44
DS-3	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1876	1,876.00	LF	$7.82	$14,665.44
EX-2	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1876	1,876.00	LF	$7.82	$14,665.44
IRI-1	Portland cement grout - 4 in. (labor, equip, materials)	4"	347	347.00	LF	$7.82	$2,712.64

IRI-4	Portland cement grout - 4 in. (labor, equip, materials)	4"	1417	1,417.00	LF	$7.82	$11,077.26
IRI-5	Portland cement grout - 4 in. (labor, equip, materials)	4.625"	347	347.00	LF	$7.82	$2,712.64
IRI-6	Portland cement grout - 4 in. (labor, equip, materials)	4"	1627	1,627.00	LF	$7.82	$12,718.91
IRI-7	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1876	1,876.00	LF	$7.82	$14,665.44
IRI-8	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	347	347.00	LF	$7.82	$2,712.64
MU-2	Portland cement grout - 6 in. (labor, equip, materials)	5"	1876	1,876.00	LF	$10.92	$20,487.23
MWA-2	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	347	347.00	LF	$11.88	$4,121.39
MWB-2	Portland cement grout - 6 in. (labor, equip, materials)	5"	1627	1,627.00	LF	$10.92	$17,767.98
MWD-1	Portland cement grout - 6 in. (labor, equip, materials)	5"	1876	1,876.00	LF	$10.92	$20,487.23
MWD-2	Portland cement grout - 6 in. (labor, equip, materials)	5"	1876	1,876.00	LF	$10.92	$20,487.23
7H-1R	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1876	1,876.00	LF	$11.88	$22,281.63
7H-1V	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1876	1,876.00	LF	$11.88	$22,281.63
7H-2I	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1876	1,876.00	LF	$11.88	$22,281.63
12H-I	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
12H-R	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
10H-I	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
11H-I	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
10H-R	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
11H-R	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1935	1,935.00	LF	$11.88	$22,982.38
DS-4	Portland cement grout - 4	4.5"	1876	1,876.00	LF	$7.82	$14,665.44

	in. (labor, equip, materials)						
BG-5	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1645	1,645.00	LF	$7.82	$12,859.62
DS-5	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1902	1,902.00	LF	$7.82	$14,868.69
BG-6	Portland cement grout - 4 in. (labor, equip, materials)	4.5"	1639	1,639.00	LF	$7.82	$12,812.72
WSW-2	Portland cement grout - 8 in. (labor, equip, materials)	7.625"	1460	1,460.00	LF	$11.88	$17,340.71
DVPW-1(A)	Portland cement grout - 8 in. (labor, equip, materials)	7"	2350	2,350.00	LF	$11.88	$27,911.42
DVPW-(B)	Portland cement grout - 8 in. (labor, equip, materials)	7"	2350	2,350.00	LF	$11.88	$27,911.42
10H-1V	Portland cement grout - 8 in. (labor, equip, materials)	7"	2010	2,010.00	LF	$11.88	$23,873.17
13H-I	Portland cement grout - 8 in. (labor, equip, materials)	8"	2335	2,335.00	LF	$11.88	$27,733.26
13H-R	Portland cement grout - 8 in. (labor, equip, materials)	8"	2310	2,310.00	LF	$11.88	$27,436.33
8H-I	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89
8H-R	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89
14H-I	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89
14H-R	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89
WSW-3	Portland cement grout - 8 in. (labor, equip, materials)	7"	1420	1,431.00	LF	$11.88	$16,996.27
WSW-4	Portland cement grout - 8 in. (labor, equip, materials)	7"	1431	1,431.00	LF	$11.88	$16,996.27
A (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1844	1,844.00	LF	$11.88	$21,901.56
B (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1879	1,879.00	LF	$11.88	$22,317.26
C (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1898	1,898.00	LF	$11.88	$22,542.93
D (Phase 1)	Portland cement grout - 8 in. (labor, equip,	6.5"	1949	1,949.00	LF	$11.88	$23,148.66

	materials)						
E (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1967	1,967.00	LF	$11.88	$23,362.45
F (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1933	1,933.00	LF	$11.88	$22,958.63
G (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	2012	2,012.00	LF	$11.88	$23,896.93
H (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1983	1,983.00	LF	$11.88	$23,552.49
I (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1986	1,986.00	LF	$11.88	$23,588.12
J (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	2038	2,038.00	LF	$11.88	$24,205.73
K (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1963	1,963.00	LF	$11.88	$23,314.94
L (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1901	1,901.00	LF	$11.88	$22,578.56
M (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1917	1,917.00	LF	$11.88	$22,768.59
DS-7 (Phase 1)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1897	1,897.00	LF	$11.88	$22,531.05
N (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5	1859	1,859.00	LF	$11.88	$22,079.71
O (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5	1807	1,807.00	LF	$11.88	$21,462.10
P (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1817	1,817.00	LF	$11.88	$21,580.87
Q (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1836	1,836.00	LF	$11.88	$21,806.54
R (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1835	1,835.00	LF	$11.88	$21,794.66
S (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1744	1,744.00	LF	$11.88	$20,713.84
T (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1739	1,739.00	LF	$11.88	$20,654.45
U (Phase 2)	Portland cement grout - 8 in. (labor, equip, materials)	6.5"	1694	1,694.00	LF	$11.88	$20,119.98
DS-6 (Phase 3)	Portland cement grout - 4 in. (labor, equip, materials)	4"	1882	1,882.00	LF	$7.82	$14,712.35

9H-I	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89
9H-R	Portland cement grout - 8 in. (labor, equip, materials)	7"	2110	2,110.00	LF	$11.88	$25,060.89

Job Hours: **460.00** **Total Cost:** **$1,417,767.87**

BULLDOZER WORK

Task description: **Re-grade Process Ponds**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 03A State: Colorado Abbreviation: None
Date: 4/16/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume: 52,723
Swell factor: 1.110
Loose volume: **58,523** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 175 feet
Unadjusted hourly production: 562.2 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 2,800 lbs/LCY

Weight description: Clay - Natural bed

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.821	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.3680

Adjusted unit production: 206.89 LCY/hr
Adjusted fleet production: **413.78** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.958/LCY

Total job time: **141.43** Hours
Total job cost: **$56,045.00**

BULLDOZER WORK

Task description: **Re-grade Plant Area**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
Date: 4/16/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume: 19,682
Swell factor: 1.110
Loose volume: **21,847** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 150 feet
Unadjusted hourly production: 634.3 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: -5 %
Average site altitude: 6,600 feet

Material weight: 2,800 lbs/LCY

Weight description: Clay - Natural bed

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.821	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4103

Adjusted unit production: 260.25 LCY/hr
Adjusted fleet production: **520.5** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.761/LCY

Total job time: **41.97** Hours
Total job cost: **$16,632.39**

BULLDOZER WORK

Task description: **Re-grade Well Pads**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #:	05A	State:	Colorado	Abbreviation:	None
Date:	4/23/2014	County:	Rio Blanco	Filename:	TR-35
User:	THM				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D8T - 8SU
Horsepower:	310
Blade Type:	Semi-Universal
Attachment:	NA
Shift Basis:	1 per day
Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume:	74,547
Swell factor:	1.110
Loose volume:	**82,747** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 75 feet
Unadjusted hourly production: 1,017.1 LCY/hr

Materials consistency description: Partly consolidated stockpile 1.1

Average push gradient: 5 %
Average site altitude: 6,600 feet

Material weight: 2,800 lbs/LCY

Weight description: Clay - Natural bed

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.100	(CAT HB)
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	0.903	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.821	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4061

Adjusted unit production: 413.04 LCY/hr
Adjusted fleet production: **826.08** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.480/LCY

Total job time: **100.17** Hours
Total job cost: **$39,693.04**

BULLDOZER WORK

Task description: **Distribute 6" of topsoil over 8 acre process pond area**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 06A State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume: 6,453
Swell factor: 1.000
Loose volume: **6,453** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 150 feet
Unadjusted hourly production: 634.3 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 545.05 LCY/hr
Adjusted fleet production: **1090.1** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.364/LCY

Total job time: **5.92** Hours
Total job cost: **$2,345.73**

BULLDOZER WORK

Task description: **Distribute 6" topsoil over 6.2 acre process area**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #:	07A	State:	Colorado	Abbreviation:	None
Date:	4/23/2014	County:	Rio Blanco	Filename:	TR-35
User:	THM				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D8T - 8SU
Horsepower:	310
Blade Type:	Semi-Universal
Attachment:	NA
Shift Basis:	1 per day
Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume:	5,000
Swell factor:	1.000
Loose volume:	**5,000** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 150 feet
Unadjusted hourly production: 634.3 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 545.05 LCY/hr
Adjusted fleet production: **1090.1** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.364/LCY

Total job time: **4.59** Hours
Total job cost: **$1,817.55**

BULLDOZER WORK

Task description: **Replace topsoil over re-graded well pads and access roads**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 08A State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume: 28,394
Swell factor: 1.000
Loose volume: **28,394** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 2,100 lbs/LCY

Weight description: Earth - Loam

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.095	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.6544

Adjusted unit production: 557.94 LCY/hr
Adjusted fleet production: **1115.88** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.355/LCY

Total job time: **25.45** Hours
Total job cost: **$10,083.06**

BULLDOZER RIPPING WORK

Task description: **Rip compacted areas**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 09A State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU Horsepower: 310
Ripper Attachment: 3-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$63.00	NA
Operating Cost/Hour:	$104.03	100
Ripper Operating Cost/Hour:	$6.53	100
Operator Cost/Hour:	$37.41	NA
Total Unit Cost/Hour:	$210.98	
Total Fleet Cost/Hour:	**$421.97**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 18.70 acres Rip Depth (ft): 2.00 Volume: 60,339 BCY or CCY

Source of estimated quantity: Staff Estimate

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	mph
Average Ripping Width:	7.08	degrees
Average Ripping Length:	300.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.800	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.800	Acres/hr
Site Altitude:	6,600	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.66	Acres/hr
Adjusted Hourly Fleet Production:	**1.33**	Acres/hr

JOB TIME AND COST

Fleet size: 2 Grader(s) Total job time: **14.09** Hours

Unit cost: $317.920 Per acre Total job cost: **$5,945.00**

BULLDOZER WORK

Task description: **Distribute 6" topsoil over18.7 acres of decompacted area**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #:	10A	State:	Colorado	Abbreviation:	None
Date:	4/23/2014	County:	Rio Blanco	Filename:	TR-35
User:	THM				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D8T - 8SU
Horsepower:	310
Blade Type:	Semi-Universal
Attachment:	NA
Shift Basis:	1 per day
Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$56.69	NA
Operating Cost/Hour:	$104.03	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$37.41	NA

Total unit Cost/Hour: $198.13
Total Fleet Cost/Hour: **$396.26**

MATERIAL QUANTITIES

Initial Volume:	15,053
Swell factor:	1.000
Loose volume:	**15,053** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 732.64 LCY/hr
Adjusted fleet production: **1465.28** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.270/LCY

Total job time: **10.27** Hours
Total job cost: **$4,070.86**

REVEGETATION WORK

Task description: **Revegetate 44.9 acres**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 11A State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			$	$
			Total Fertilizer Materials Cost/Acre	**$0.00**

Application

Description	Cost /Acre
	$
Total Fertilizer Application Cost/Acre	**$0.00**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$98.01
Weed control spraying (MEANS 31 31 16.13 3100)	$145.20
Total Tilling Cost/Acre	**$243.21**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alkali Sacaton	0.10	3.90	$2.28
Crested Wheatgrass - Ephraim	4.00	18.37	$8.92
Blue Wildrye - Arlington or Elkton	1.50	5.17	$17.88
Russian Wildrye - Bozoisky	1.50	6.03	$9.36
Hard Fescue - Discovery	1.00	12.97	$2.09
Pubescent Wheatgrass - Luna	1.50	3.10	$3.36
Yellow Sweet Clover - Madrid	0.50	2.98	$1.28
Tall Wheatgrass - Jose	1.80	3.26	$4.05
Thickspike Wheatgrass - Critana	4.30	15.20	$22.23
Sweetvetch, Utah or Northern	0.10	0.05	$4.09

Western Wheatgrass - Barton	1.50	3.79	$5.52
Yarrow, Western	0.20	12.16	$6.13
Totals Seed Mix	18.00	86.97	**$87.18**

Application

Description	Cost /Acre
Drill seeding (MEANS 32 92 19.13 0020)	$404.00
Total Seed Application Cost/Acre	**$404.00**

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Herbicide - 2,4D @ 1.0 pt/ac	2.00	ACRE	$1.23	$2.46
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$265.00	$530.00
Total Mulch Materials Cost/Acre				**$532.46**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$65.89
Power mulcher (MEANS 32 91 13.16 0250)	$86.68
Total Mulch Application Cost/Acre	**$152.57**

NURSERY STOCK PLANTING

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					$
Totals Nursery Stock Cost / Acre					**$0.00**

JOB TIME AND COST

No. of Acres: 73.76 Cost /Acre: $1,419.42
Estimated Failure Rate: 30% Cost /Acre*: $1,419.42
*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **$104,696.42**
Reseeding Job Cost: **$31,408.93**
Total Job Cost: **$136,105.34**
Job Hours: **73.76**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization**

Site: **Nahcolite Project** Permit Action: TR-35 Permit/Job#: M1983194

PROJECT IDENTIFICATION

Task #: 12A State: Colorado Abbreviation: None
Date: 4/23/2014 County: Rio Blanco Filename: TR-35
User: THM

Agency or organization name: DRMS

EQUIPMENT TRANSPORT RIG COST

Shift basis: 1 per day
Cost Data Source: CRG Data

Truck Tractor Description: GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED, 400 HP (2ND HALF, 2006)

Truck Trailer Description: GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT TRAILER (25T, 50T, AND 100T)

Cost Breakdown:

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	$16.63	$18.37	$22.33
Operating Cost/Hour:	$44.38	$46.13	$50.07
Operator Cost/Hour:	$27.66	$27.66	$27.66
Helper Cost/Hour:	$0.00	$25.39	$25.39
Total Unit Cost/Hour:	$88.67	$117.55	$125.45

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D8T - 8SU	53.08	$65.28	$125.45	2	$381.46	$250.90	$500.00
Drill/Broadcast Seeder with Tractor	25.00	$39.59	$88.67	1	$128.26	$88.67	$250.00
Power Mulcher (Reinco M90)	6.00	$7.03	$88.67	1	$95.70	$88.67	$250.00
Subtotals:					**$605.42**	**$428.24**	**$1,000.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 3/4 T.	$14.59	2	$29.18	$29.18
Subtotals:			**$29.18**	**$29.18**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	RIFLE	
Total one-way travel distance:	60.00	miles
Average Travel Speed:	40.00	mph
Total Non-Roadable Mob/Demob Cost *	$6,311.82	
'* two round trips with haul rig:		
Total Roadable Mob/Demob Cost **	$87.54	
** one round trip, no haul rig:		

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	1.50	1.50
Return Time (Hours):	1.50	1.50
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	4.00	3.00

JOB TIME AND COST

Total job time:	**8.00**	Hours
Total job cost:	**$6,399.36**	