



Uranerz Energy Corporation
(an Energy Fuels Company)
1701 East "E" Street
Casper, WY 82605
307-265-8900
www.energyfuels.com

December 21, 2016

Attn: Document Control Desk
Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Deputy Director
Division of Decommissioning, Uranium Recovery, and Waste Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T-8F5
11545 Rockville Pike
Rockville, MD 20852-2738

Re: Uranerz Energy Corporation, Nichols Ranch Project, Source Materials License SUA-1597, License Condition 9.5 Financial Assurance Annual Update, Docket No. 40-9067, and NRC Request for Additional Information, Uranerz Energy Corporation, Nichols Ranch Project, Source Materials License SUA-1597, Annual Financial Assurance Estimate Adjustment (TAC NO. L00758),

Dear Director and Deputy Director,

Pursuant to License Condition 9.5 Uranerz Energy Corporation (Uranerz) annual updates to the financial assurance shall be provided annually to the NRC by December 29. Uranerz currently holds a Six Million, Eight Hundred Thousand Dollar (\$6,800,000) financial assurance bond that was accepted by the Wyoming Department of Environmental Quality Land Quality Division (WDEQ-LQD) with the issuance of the Permit to Mine No. 778. Uranerz recently completed the annual surety review, as required by the WDEQ-LQD, concluding the surety amount \$6,800,000 remains sufficient.

The overall estimate decreased slightly from the last WDEQ-LQD approved amount of \$6,719,536 (2014) to \$6,219,928. This constitutes a decrease of \$499,608 from the 2014 year's estimate. When compared to the 2015 (as submitted August 12, 2016) estimate of \$6,088,553 it constitutes a slight increase of \$131,375.

There are some significant changes with this estimate. Per Uranerz responses dated August 12, 2016, to NRC Request for Additional Information, Uranerz committed to re-baselining the costs. WDEQ-LQD issued their Guideline 12 Standardized Reclamation Performance Bond Format and Cost Calculation Methods published May 2016. Costs derived from this Guideline were updated. As well, other costs such as utilities, transportation, labor, etc. were updated. New to the estimate this year is the addition of a Master Cost sheet containing itemized cost information



Uranerz Energy Corporation
(an Energy Fuels Company)
1701 East "E" Street
Casper, WY 82605
307-265-8900
www.energyfuels.com

including the rate (aka unit cost), the 10 % cost of profit and overhead (if not already included in the rate), the unit, and the source. Also note that the consumer price index adjustment was updated for costs 2013-2016 and only applied as necessary. Included with this submittal is the description of changes made by page to the estimate.

If you have any questions regarding the provided information, please contact me at 307-265-8900 or by email at dkolkman@energyfuels.com.

Sincerely,

A handwritten signature in black ink that reads 'Dawn Kolkman'.

Dawn Kolkman
Permitting Manager
Uranerz Energy Corporation (an Energy Fuels company)

Attachments:

cc: Ron Linton, NRC Project Manager (via email)



Surety Summary Page

- With the addition of a Master Cost sheet the 10% Profit and Overhead costs could be applied to specific costs which did not already have that accounted for in the rate. This eliminated a 'blanketed' application of the 10% which proved to be 'double dipping' on most rates.
- The Consumer Price Index information was moved to the Master Cost sheet.
- Overall Price changes between the 2016 and 2015 estimates:

Cost Item	2016 Cost	2015 Cost	Change
GROUNDWATER RESTORATION COST	\$3,085,754	\$2,948,747	\$137,007
PLANT EQUIPMENT REMOVAL AND DISPOSAL COST	\$113,472	\$200,098	-\$86,625
BUILDING DEMOLITION AND DISPOSAL COST	\$1,307,665	\$764,841	\$542,823
SOIL REMOVAL & DISPOSAL COST	\$78,473	\$83,546	-\$5,073
TOTAL WELL ABANDONMENT COST	\$561,537	\$608,704	-\$47,168
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL COST	\$164,246	\$203,076	-\$39,918
TOPSOIL REPLACEMENT & REVEGETATION COST	\$90,769	\$56,727	\$34,041
MISCELLANEOUS RECLAMATION COST	\$6,717	\$5,102	\$1,615

*Not including 15% Unknown Contingency

Worksheet 1, No. I

Plant & Office –

Technical Assumptions

- Wellfield Area – after further evaluation the square footage was revised to portray the actual value. Production Area #1 was reduced by 348,912 ft². Production Area #2 was reduced by half because only one header house (header house 9) is in place. Header house 10 has been deferred for the coming year. The change cascaded changing the Wellfield Area (Acres).
- Avg Completed Thickness – was increased from 8.6 ft. up to 18.6.



- The number of Recovery and Injection wells was revised in PA#1 and PA#2 to account for actual number of wells installed at this time.
- Groundwater Sweep
 - Cost Assumptions
 - Avg Connected Hp – was increased from 15 upto 20 to match actual horsepower being used.
 - Kwh's/Hp – efficiency of the 20 Hp systems at surface have a 90% efficiency whereas downhole pumps generally have only an 80% efficiency.
 - Gallons per Minute was increased to 150 as that is what the permitted value is for the deep disposal wells.
 - Analysis (\$/Kgals) – was removed as it is now accounted for in monitoring costs on Worksheet 1, Nos. IV & VI.
 - Utilities
 - Power (\$/Month) was removed because it represented a double cost line item. Cost assumptions for power are already accounted for in Plant & Office as well as the Wellfield.
 - Propane cost was increased.

Wellfield –

- Cost Assumptions
 - Power
 - Avg Flow/Pump (gpm) was increased to 14.9 to represent actual rates.
 - Avg Hp/Pump was increased to 3.5 to represent actual average horsepower.
 - Avg # of Pumps Required was decreased to 10 to represent actual number of pumps.
 - Gallons per Minute was increase to 150 gpm as that is what the permitted value is for the deep disposal wells.

Worksheet 1, No. II

Groundwater Restoration –
II Reverse Osmosis (RO)

- Cost Assumptions
 - Avg Connected Hp was increased up to 180 representing actual horsepower
 - Kwh/Hp was recalculated using 90% efficiency because surface pumps unlike vertical downhole pumps have a higher efficiency.
 - Gallons per Minute was increased to 750 as it should be the same as the Feed to RO.
- Chemicals
 - Antiscalent was increased to reflect current costs. This cost was moved to the Master Cost sheet.



- Reductant Sulfide was removed as it is not something planned for use.
- Sampling and Analysis cost was removed and is being accounted for on Worksheet 1, Nos. IV & VI
- Pumping Costs for power to the RO Brine system and the RO permeate were added as new sections to this worksheet. These costs are necessary to account for power to get the flow from RO Brine to the Deep Disposal Well (DDW) and the power to get the flow from the RO Permeate back to the Wellfield.
- Utilities
 - Power (\$/Month) was removed as it is accounted for in the pumping costs in this section.
 - Propane cost was increased.

Wellfield –

- Cost Assumptions
 - Power
 - Avg Flow/Pump (gpm) was increased to 14.9 to represent actual rates.
 - Avg Hp/Pump was increased to 3.5 to represent actual average horsepower.
 - Avg # of Pumps Required was decreased to 10 to represent actual number of pumps.
 - Gallons per Minute was increase to 750 gpm as it should match the gpm provided in the RO gallons per Minute.

Worksheet 1, No. III -

Deep Disposal Well (DDW)

- Total Disposal Requirement – as a result of changes on the previous Worksheets 1, No. I & II the Total Gallons on this worksheet was increased thus creating cascading changes to subsequent line items Total Kgallons, Total Gallons etc.
- Cost Assumptions
 - Kwh's/HP - efficiency of the 150 Hp systems at surface have a 90% efficiency whereas downhole pumps generally have only an 80% efficiency.
 - Gallons per Minute – was increased to the permitted flow to the deep disposal wells
- Corrosion Inhibitor - was removed as that is not used in the system.
- Antiscalent was increased to reflect current costs. This cost was moved to the Master Cost sheet.

Worksheet 1, Nos. IV & VI -

- A new section was added. Section Va. Deep Disposal Well Monitoring – added to account for the compliance monitoring required during use of deep wells during the restoration period. With the addition of this monitoring and analysis is accounted for.
- Labor increased with the change in the Time Required – Years to complete restoration.



Worksheet I, Nos. VII & VIII & Summary

- Summary – a line item was added to account for the deep disposal well monitoring

Worksheet 2a -

- Volume – Column Header houses and manifold – reduced by 1 header house in PA#2. Header house 10 was not constructed during the period and has been deferred at this time.
- Dismantle and Loading Cost – the pricing was outdated so the cost has been rebaselined using RS Means 2016 Building Construction Costs Data. They provide cost per square foot to the Volume (cubic yards) was converted to square feet and multiplied by the costs.
- Transportation and Disposal
 - Landfill Site
 - Transport costs increased by 0.08 cents up to \$0.18
 - Disposal Cost increased by \$2 up to \$47.
 - Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost - based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 2b –

Demolition and Disposal

- Demolition Volume – Header Houses, Manifold & Fuel Island Pad – reduced by 1 header house in PA#2 as header house 10 was not installed and has been deferred.
- Factor for Gutting and Cost for Gutting line items were removed as that is accounted for on Worksheet 2a in the Dismantle and Loading Costs that were revised as described above.
- Transport costs increased by 0.08 cents up to \$0.18
- Disposal Cost increased by \$2 up to \$47.

Concrete Decontamination, Demo & Disposal

- Area of concrete pad – Header Houses, Manifold & Fuel Island Pad – reduced by 2 header houses in PA#1 because header houses 7 & 8 were not installed with a concrete basement. Also reduced by 1 header house in PA#2 as header house 10 was not installed and has been deferred.
- Percent Requiring Decontamination – Main Process Building – was reduced to 29% because Uranerz had almost three quarters of the plant floor coated to inhibit contamination.



- Decontamination unit cost was revised using \$1.02. The cost was outdated and was re-baselined using RS Means 2016 Building Construction Costs Data.

Transportation and Disposal

- Landfill Site
 - Transport costs increased by 0.08 cents up to \$0.18
 - Disposal Cost increased by \$2 up to \$47.
- Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 3 –

Soil Excavation, Transport & Disposal

- Quantity to be Shipped – Header Houses, Manifold & Fuel Island Pad – reduced by 1 header house in PA#2 as header house 10 was not installed and has been deferred.
- The Distance (Miles) was corrected
- Transport Cost – was increased by 0.04 cents up to \$0.14
- Disposal cost – based on contract the cpi was added this year
- Unloading Cost – based on contract the cpi was added this year

Removal NPDES Pts. – this section was removed as Nichols Ranch is a zero discharge facility at this time and there have been no costs to account for in the last 5 years as such.

Radiation Survey – this section dealt with performing a radiation survey of the ground area (aka soils) which is also account for Worksheet 6, Nos. II & III. Therefore this cost was being incorrectly duplicated.

Worksheet 4 –

Materials

- Cement Cone/Markers – cost was removed - Per Chpt 8 Noncoal rules and regulations a concrete cap *or* dry nonslurry materials may be used and is account for in sealing drill hole.
- Labor – was revised to use General Labor costs which are accounted for on the Master Cost sheet.

Equipment Rental

- Labor Cost per Hour and Backhoe w/out Operator were used to calculate the equipment usage cost. Rates are on the Master Cost sheet



Worksheet 5, No. I –

Wellfield Piping

- Total number of wells – well count was updated
- Feeder lines from HH to injection wells 1" HDPE – was significantly increased using an average of 400 ft of feeder line between the header house and the injection well.
- Feeder lines from production wells to HH 1" HDPE – was also significantly increased based on an average of 400 ft of feeder line between the header houses and the production well.

Transport and Disposal

- Landfill Site
 - Transport costs increased by 0.08 cents up to \$0.18
 - Disposal Cost increased by \$2 up to \$47.
- Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 5, No. II –

Production Well Pumps

- Number of Production Wells was updated
- Weight of Pumps was added – assuming a pump weight of 57 lbs
- Disposal Weight in tons was added in order to calculate the number of truck loads based on weight rather than quantity of pumps per truckload.

Survey & Decontamination

- Percent Requiring Decontamination – reduced to 0 as all will be transported to a licensed facility rendering a need for decontamination null.

Tubing Volume Reduction & Loading

- Total Quantity – Nichols Ranch uses layflat boreline versus polypipe therefore the quantity of this type of tubing is calculated and disposed of differently. The quantity is the length time the number of wells.
- Cost of Removal – was removed because the pump and boreline are removed as one unit therefore the cost of pump removal include the cost of the boreline tubing removal.
- Quantity per Truck Load was re-evaluated in tons.

Transport and Disposal



- Landfill Site
 - Transport costs increased by 0.08 cents up to \$0.18
 - Disposal Cost increased by \$2 up to \$47.
- Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 5, No. III -

Buried Trunkline

- Entire section was revised, reformatted and re-baselined. Length of Trunkline Trench was recalculated based off of on-site surveys. Added other trunkline sizes to reflect actual pipe installation between header house and CPP.

Transport and Disposal

- Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 5, No. IV –

Manholes

- Quantity - an additional manholes was accounted for in PA#2 for header house 9.
- Disposal Weight – was recalculated
- Total Number of Truck Loads – calculation corrected

Transport and Disposal

- Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Worksheet 6, No. I –

Radiation Survey – Unit cost was increased up to \$1,714 per ERG



Worksheet 6, Nos. II & III –

Wellfield

- Radiation Survey – Unit cost was increased up to \$1,714 per ERG
- Spill Clean Up
 - Affected Area – increased slightly by 0.01.
- Transport and Disposal
 - Licensed Site
 - The Distance (Miles) was corrected
 - Transport Cost – was increased by 0.04 cents up to \$0.14
 - Disposal cost – based on contract the cpi was added this year
 - Unloading Cost – based on contract the cpi was added this year

Roads

- Affected Area – increased to account for new secondary access road between the cement silo area and PA#1 header house 8 area.
- Radiation Survey - Unit cost was increased up to \$1,714 per ERG

Worksheet 6, Nos. IV & V -

Affected Area – increased up to 5.97 acres

Radiation Survey - Unit cost was increased up to \$1,714 per ERG

Section V – Remedial Action – removed. This section dealt with items from NPDES and spills. Spills are accounted for on Worksheet 6 Nos. II & III (Item II.C.) and we are a zero discharge facility therefore the section was deleted. Should those circumstances change the surety estimate will be updated appropriately.

Worksheet 7 –

Fence Removal & Disposal – the Quantity was increased in PA#2

Culvert Removal & Disposal – the Quantity was increased in PA#1 and PA#2



12.20.16

Surety Estimate 2016

Nichols Ranch In-Situ Recovery Project Uranerz Energy Corporation - an Energy Fuels Company

Total Restoration and Reclamation Cost Estimates

No.	Cost Item	Cost
1	GROUNDWATER RESTORATION COST	\$3,085,754
2a	PLANT EQUIPMENT REMOVAL AND DISPOSAL COST	\$113,472
2b	BUILDING DEMOLITION AND DISPOSAL COST	\$1,307,665
3	SOIL REMOVAL & DISPOSAL COST	\$78,473
4	TOTAL WELL ABANDONMENT COST	\$561,537
5	WELLFIELD EQUIPMENT REMOVAL & DISPOSAL COST	\$164,246
6	TOPSOIL REPLACEMENT & REVEGETATION COST	\$90,769
7	MISCELLANEOUS RECLAMATION COST	\$6,717
	Subtotal Restoration and Reclamation Cost Estimate	\$5,408,633
8	Miscellaneous Items	
	Contractor Profit & Overhead (10%) ¹	See Master Costs
	Unknown Contingency (15%) ²	\$811,295
	TOTAL CALCULATED IN 2016 DOLLARS ³	\$6,219,928

¹, Per WDEQ/LQD Guideline No. 12, Section II(B)(12)(b)

², Per WDEQ/LQD Guideline No. 12, Section II(B)(12)(a) and (c-h), Section II(B)(13) and NRC License Condition 9.5

³, Costs reflect both WDEQ & NRC requirements. No salvage value assumed.

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 1, No. 1 --
GROUNDWATER RESTORATION

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
Technical Assumptions				
Wellfield Area (Ft ²)	1,573,826	222,076		
Wellfield Area (Acres)	36.13	5.10		PA#1=8 Header Houses, PA#2=1 Header House
Affected Ore Zone Area (Ft ²)	1,573,826	222,076		
Avg Completed Thickness (Ft)	18.6	18.6		
Factor for Flare	1.45	1.45		
Affected Volume:	42,446,087	5,989,397		
Porosity	0.27	0.27		
Gallons per Cubic Foot	7.48	7.48		
Gallon per Pore Volume	85,724,118	12,096,187		
Number of Wells in Unit(s)				
Recovery Wells	220	40		Recovery Wells for 8 Header Houses, PA#1 and 1 Header House, PA#2
Injection Wells	397	81		Injection Wells for 8 Header Houses and 1 Header House PA#2
Monitor Wells	68	45		Monitoring Ring, Overlying, Underlying & Production Wells
Average Well Spacing (Ft)	100	100		
Average Well Depth (Ft)	550	550		
I Groundwater Sweep				
A. Plant & Office				
Operating Assumptions:				
Flowrate (gpm)	150	150		
PV's Required	1.00	1.00		
Total Gallons for Treatment	85,724,118	12,096,187		
Total Kgals for Treatment	85,724	12,096		
Cost Assumptions:				
Power				
Avg Connected Hp	20	20		
Kwh's/Hp	0.83	0.83		
Gallons per Minute	150	150		
Gallons per Hour	9000	9000		
Cost per Hour	\$0.99	\$0.99		
Cost per Kgal (\$)	\$0.11	\$0.11		
Total Cost per Kgal	\$0.19	\$0.19		
Total Treatment Cost	\$16,075	\$2,268		
Utilities				
Time for Treatment				
Minutes for Treatment	571,494	80,641		
Hours for Treatment	9,525	1,344		
Days for Treatment	397	56		
Average Days per Month	30	30		
Months for Treatment	13.2	1.9		
Years for Treatment	1.10	0.16		
Utilities Cost (\$)	\$50,773	\$7,164		
TOTAL PLANT & OFFICE COST	\$66,848	\$9,433	\$76,281	
B. WELLFIELD				
Cost Assumptions:				
Power				
Avg Flow/Pump (gpm)	14.9	14.9		Average flow of PA1 for 2 years (Bernard)
Avg Hp/Pump	3.5	3.5		
Avg # of Pumps Required	10	10		
Avg Connected Hp	35	35		
Kwh's/Hp	0.93	0.93		
Gallons per Minute	150	150		
Gallons per Hour	9000	9000		
Costs per Hour (\$)	\$1.97	\$1.97		
Costs per Gallon (\$)	\$0.0002	\$0.0002		
Costs per Kgal (\$)	\$0.22	\$0.22		
Total Cost per Kgal	\$0.30	\$0.30		
TOTAL WELLFIELD COST	\$25,378	\$3,581		
TOTAL GROUNDWATER SWEEP COST	\$92,226	\$13,014	\$105,240	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 1, No. II
GROUNDWATER RESTORATION

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
II REVERSE OSMOSIS (RO)				
A. PLANT & OFFICE				
Operating Assumptions:				
Flowrate (gpm)	150	150		
PV's Required	6	6		
Total Gallons for Treatment	514,344,706	72,577,122		
Total Kgal for Treatment	514,345	72,577		
Feed to RO (gpm)	750	750		
Permeate Flow (gpm)	600	600		
Brine Flow (gpm)	150	150		
Average RO Recovery	80%	80%		
Cost Assumptions:				
Power (RO)				
Avg Connected Hp	180	180		
kWh/Hp	0.83	0.83		
Gallons per Minute	750	750		
Gallons per Hour	45000	45000		
Cost per Hour (\$)	\$8.95	\$8.95		
Cost per Gallon (\$)	\$0.0002	\$0.0002		
Cost per Kgal (\$)	\$0.20	\$0.20		
Total Cost per Kgal (\$)	\$0.89	\$0.89		
Total Pumping Cost (\$)	\$460,304	\$64,952		
Power (RO Brine to DDW)				
Avg Connected Hp	20	20		
kWh/Hp	0.83	0.83		
Gallons per Minute	150	150		
Gallons per Hour	9,000	9,000		
Cost per Hour (\$)	\$0.99	\$0.99		
Cost per Gallon (\$)	\$0.0001	\$0.0001		
Cost per Kgal (\$)	\$0.11	\$0.11		
Total Pumping Cost (\$)	\$11,369	\$1,604		
Power (RO Permeate to Wellfield)				
Avg Connected Hp	190	190		
kWh/Hp	0.83	0.83		
Gallons per Minute	600	600		
Gallons per Hour	36,000	36,000		
Cost per Hour (\$)	\$9.45	\$9.45		
Cost per Gallon (\$)	\$0.0003	\$0.0003		
Cost per Kgal (\$)	\$0.26	\$0.26		
Total Pumping Cost (\$)	\$108,005	\$15,240		
Utilities				
Time for Treatment				
Minutes for Treatment	685,793	96,769		
Hours for Treatment	11,430	1,613		
Days for Treatment	476	67		
Average Days per Month	30	30		
Months for Treatment	16	2		
Utilities Cost (\$)	\$60,125.94	\$8,603.50		
TOTAL PLANT & OFFICE COST	\$639,804	\$90,400	\$730,203	
B. WELLFIELD				
Cost Assumptions:				
Power (wellfield to RO)				
Avg Flow/Pump (gpm)	14.9	14.9		
Avg Hp/Pump	3.5	3.5		
Avg # of Pumps Required	10	10		
Avg Connected Hp	35	35		
Kwh's/Hp	0.93	0.93		
Gallons per Minute	750	750		
Gallons per Hour	45000	45000		
Costs per Hour (\$)	\$1.96	\$1.96		
Costs per Gallon (\$)	\$0.00004	\$0.00004		
Costs per Kgal (\$)	\$0.04	\$0.04		
Total Cost per Kgal	\$0.12	\$0.12		
TOTAL WELLFIELD COST	\$61,987	\$8,747	\$70,734	
TOTAL REVERSE OSMOSIS COST	\$701,791	\$99,146	\$800,937	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 1, No III --
GROUNDWATER RESTORATION

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
III Deep Disposal Well (DDW)				
Operating Assumptions:				
Total Disposal Requirement				
Total Gallons	188,593,059	26,611,611		Total GWS Gallons + RO Brine Flow (Total RO Flow X 20%)
Total Kgallons	188,593	26,612		
Brine Concentration Factor	1	1		
Total Gallons	188,593,059	26,611,611		
Months of RO Operation	28.9	4.1		
Average Monthly Req'm't (Gallons)	6,526,843	6,526,843		
Average Flow (gpm)	150	150		
Total DDW Disposal (gallons)	188,593,059	26,611,611		
Total DDW Disposal (Kgallons)	188,593	26,612		
Cost Assumptions:				
Avg Connected Hp	150	150		
Kwh's/Hp	0.83	0.83		
Gallons per Minute	150	150		Permitted max flow of 150 per well
Gallons per Hour	9000	9000		
Cost per Hour (\$)	\$7.46	\$7.46		
Cost per Gallon (\$)	\$0.0008	\$0.0008		
Cost per Kgal (\$)	\$0.83	\$0.83		
Total Cost per Kgallon	\$1.596	\$1.596		
TOTAL DEEP DISPOSAL WELL COST	\$301,049	\$42,480	\$343,529	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 1, Nos. IV & VI --
GROUNDWATER RESTORATION

Cost Item	Mining Unit		Labor Cost Factors		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)				
IV RESTORATION MONITORING						
Operating Assumptions:						
Time of Restoration (months)	29	4				
Frequency of Analysis (months)	2	2				
Quantity of Monitoring Wells	68	45				Monitoring Ring, Overlying & Underlying Wells Only
Total Sets of Analysis	14	2				
Total Sampling & Analysis Cost (\$)	\$14,280	\$1,350			\$15,630	
V STABILIZATION MONITORING						
Operating Assumptions:						
Time of Stabilization (months)	12	12				
Frequency of Analysis (months)	2	2				Monitoring Ring Wells Only
Total Sets of Analysis	6	6				Monitoring Ring Wells Only
Frequency of Analysis (months)	4	4				Production Monitoring Wells Only
Total Sets of Analysis	3	3				Production Monitoring Wells Only
Cost Assumptions:						
Power (\$/Month)	\$0	\$0				No add'l power required to sample
Total Power Cost	\$0	\$0				
Quantity of Monitoring Ring Wells	33	24				Monitoring Ring Wells Only
Sampling & Analysis (each set)	\$10,626	\$7,728				
Quantity of Production Monitoring Wells	13	7				Production Monitoring Wells Only
Sampling & Analysis (each set)	\$390	\$210				
Total Sampling & Analysis Cost (\$)	\$11,016	\$7,938				
Utilities (\$/Month)	\$0	\$0				No add'l utilities required to sample
Total Utilities Cost (\$)	\$0	\$0				
TOTAL STABILIZATION COST	\$11,016	\$7,938			\$18,954	
Va DEEP DISPOSAL WELL MONITORING						
Operating Assumptions:						
Time of Use (months)	41	16				Restoration plus Stabilization
Frequency of Analysis (months)	3	3				Quarterly Analysis required by WQD permit
Total Sets of Analysis	14	5				
Total Sampling & Analysis Cost (\$)	\$6,461	\$2,540			\$9,002	
VI LABOR						
Cost Assumptions:	No.		Hours/Year	Cost		
Crew:						
1. Supervisor	1		2080	\$63,794		
2. Operators	4		2080	\$205,254		
3. Maintenance	2		2080	\$89,190		
4. Vehicles	2		1040	\$28,577		
Cost per Year				\$386,816		
Time Required - Years	2.41	0.34				
TOTAL RESTORATION LABOR COST	\$931,419	\$131,429			\$1,062,848	
					\$1,097,432	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 1, Nos. VII, VIII & Summary --
GROUNDWATER RESTORATION

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
VII RESTORATION CAPITAL REQUIREMENTS				
I Deep Disposal Well(s)	2	0		no new disposal wells needed for Nichols #2
II Plug and Abandon DDW	\$212,115	0		
III Reverse Osmosis Unit	\$517,500	0		Additional 500 gpm RO (purchase price)
TOTAL RESTORATION CAPITAL REQUIREMENTS	\$729,615	\$0	\$729,615	
VIII RESTORATION OF EXCURSION WELLS				
I Shallow Sand Well(s)				
Total Wells in Excursion	0	0		Assume no excursions
Cost of Clean-Up	\$0	\$0		
Total Shallow Sand Cleanup	\$0	\$0		
II Ore Zone Wells				
Total Wells in Excursion	0	0		
Cost of Clean-Up	\$0	\$0		
Total Ore Zone Cleanup	\$0	\$0		
III Deep Zone Wells				
Total Wells in Excursion	0	0		
Cost of Clean-Up	\$0	\$0		
Total Deep Zone Cleanup	\$0	\$0		
TOTAL WELLFIELD COST				
TOTAL EXCURSION CLEANUP COST	\$0	\$0	\$0	
SUMMARY:				
I GROUNDWATER SWEEP	\$105,240			
II REVERSE OSMOSIS (RO)	\$800,937			
III DEEP DISPOSAL WELL	\$343,529			
IV RESTORATION MONITORING	\$15,630			
V STABILIZATION MONITORING	\$18,954			
Va DEEP DISPOSAL WELL MONITORING	\$9,002			
SUB TOTAL	\$1,293,291			
VI LABOR	\$1,062,848			
VII RESTORATION CAPITAL REQUIREMENTS	\$729,615			
VIII RESTORATION OF EXCURSION WELLS	\$0			
TOTAL GROUNDWATER RESTORATION COST	\$3,085,754			

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 2 a
PLANT EQUIPMENT REMOVAL AND DISPOSAL

Cost Item	Nichols Mine Unit								Notes
	Office & Laboratory	Main Process Building	Maintenance Building	Resin + Sand Filter Media	External Tanks	Header Houses, Manifold	Deep Well Bldgs	Sub Total	
Volume (Yds ³)	40	200	45	110	109	190	10		Accounts for 9 Header Houses - PA#1 - 8 and PA#2 - 1.
Quantity per Truck Load (Yds ³)	20	20	20	20	20	20	20		
Number of Truck Loads	2	10	2.25	5.5	5.45	9.5	0.5		All but the resin/sand media is going to landfill therefore any partial loads will be combined to make a full load: Landfill loads = 30.7, License Facility loads = 5.5
I Decontamination Cost									
Area Decontaminated (Ft ²)	105	308	114	207	205	297	42		
Percent Requiring Decontamination	20%	100%	20%	0%	100%	100%	100%		
Total Decontamination Cost	\$80	\$233	\$86	\$156	\$155	\$225	\$32		
II Dismantle and Loading Cost									
Dismantle Volume (Ft ³)	105	308	114	207	205	297	42		
Total Dismantle Cost	\$811	\$2,370	\$877	\$1,591	\$1,581	\$2,290	\$322		
III Oversize Charges									
Percent Requiring Permits	40%	40%	40%	0%	100%	40%	40%		
Total Oversize Cost	\$331	\$1,656	\$373	\$0	\$2,256	\$1,573	\$83		
IV Transportation & Disposal									
A. Landfill									
Percent to be Shipped	100%	100%	100%	0%	100%	100%	100%		
Distance (Miles)	150	150	150	150	150	150	150		round trip
Transportation Cost	\$1,155	\$5,775	\$1,299	\$0	\$3,147	\$5,486	\$289		
Quantity per Truck Load (Yds ³)	20	20	20	20	20	20	20		
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6	21.6	21.6	21.6		
Disposal Cost	\$2,030	\$10,152	\$2,284	\$0	\$5,533	\$9,644	\$508		
Total Landfill Cost	\$3,185	\$15,927	\$3,584	\$0	\$8,680	\$15,131	\$796		
B. Licensed Site									
Percent to be Shipped	0%	0%	0%	100%	0%	0%	0%		
Distance (Miles)	1330	1330	1330	1330	1330	1330	1330		round trip
Transport Cost	\$0	\$0	\$0	\$22,688	\$0	\$0	\$0		
Quantity per Truck Load (Yds ³)	20	20	20	20	20	20	20		
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6	21.6	21.6	21.6		Based on avg 80lbs per cf
Unloading Cost	\$0	\$0	\$0	\$4,269	\$0	\$0	\$0		
Disposal Cost	0	0	0	26,402	0	0	0		
Total Licensed Site Cost	\$0	\$0	\$0	\$49,089	\$0	\$0	\$0		
Total Transportation/Disposal Cost	\$3,185	\$15,927	\$3,584	\$49,089	\$8,680	\$15,131	\$796		
TOTAL COST NICHOLS RANCH MINE	\$4,407	\$20,186	\$4,919	\$50,836	\$12,673	\$19,219	\$1,232	\$113,472	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 2 b --
BUILDING DEMOLITION AND DISPOSAL

Cost Item	Nichols Mine Unit							Notes
	Office & Laboratory	Main Process Building	Maintenance Building	Header Houses, Manifold & Fuel Island Pad	Personnel Interim Lodging	Deep Disposal Well Bldgs.	Sub Total	
STRUCTURE DEMOLITION & DISPOSAL								
Demolition Volume (Ft ³)	90,000	1,188,000	97,200	3,405	780	1,008		
Total Demolition Cost	\$29,205	\$385,506	\$31,541	\$1,105	\$253	\$327		
Volume of Disposal Material (cubic yards)	1,100	14,520	1,188	42	10	12		
Weight of Disposal Material (tons)	264	3,485	285	10	2	3		
Quantity per Truck Load (Ton)	21.6	21.6	21.6	21.6	21.6	21.6		
Number of Truckloads	12.2	161.3	13.2	0.5	0.1	0.1		
Distance to Landfill	150	150	150	150	150	150		round trip
Transportation Cost	\$29,410	\$388,208	\$31,763	\$1,113	\$255	\$329		
Total Disposal Cost (\$)	\$12,408	\$163,786	\$13,401	\$469	\$108	\$139		
TOTAL STRUCTURE DEMO & DISPOSAL	\$71,023	\$937,500	\$76,705	\$2,687	\$616	\$795	\$1,089,325	
CONCRETE DECONTAMINATION, DEMO & DISPOSAL								
Area (Ft ²) of concrete pad	9000	29700	5400	2566	0	504		1-6 header houses @360 sq ft each, manifold is 246 sq ft., fuel island is 160 sq ft
Average Thickness (Ft) (concrete depth)	0.5	0.5	0.5	0.5	0.5	1		
Volume (Ft ³) of concrete pad	4500	14850	2700	1283	0	504		
Volume Footings, platforms, etc (Ft ³)	579	9351	972	0	0	0		
Total Volume of concrete (Ft ³)	5079	24201	3672	1283	0	504		
Weight of Disposal Concrete 150lbs/cubic foot (reinforced concrete)	761,850	3,630,150	550,800	192,450	0	75,600		
Weight of Disposal in Tons	381	1815	275	96	0	38		
Quantity per Truck Load (Ton)	21.6	21.6	21.6	21.6	21.6	21.6		Partial loads will be combined to make a full load: Landfill loads = 123.2, License Facility loads = 0
Number of Truckloads	17.6	84.0	12.8	4.5	0.0	1.8		
Percent Requiring Decontamination	0%	29%	0%	10%	0%	100%		
Area Decontaminated (Ft ²)	0	8,672	0	257	0	504		
Decontamination Cost	\$0	\$8,846	\$0	\$262	\$0	\$514		
Demolition Cost	\$3,168	\$10,454	\$1,901	\$903	\$0	\$177		
Transportation & Disposal								
A. Landfill								
Percent to be Shipped	100%	100%	100%	100%	0%	100%		Round Trip
Distance (Miles)	150	150	150	150	150	150		
Transportation Cost	\$10,184	\$48,528	\$7,363	\$2,573	\$0	\$1,011		
Quantity per Truck Load (Yds ³)	20	20	20	20	20	20		
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6	21.6	21.6		
Disposal Cost	\$17,903	\$85,309	\$12,944	\$4,523	\$0	\$1,777		
Total Landfill Cost	\$28,088	\$133,837	\$20,307	\$7,095	\$0	\$2,787		
B. Licensed Site								
Percent to be Shipped	0%	0%	0%	0%	0%	0%		Round Trip
Distance (Miles)	1330	1330	1330	1330	1330	1330		
Transportation Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0		
Transport Cost	\$0	\$0	\$0	\$0	\$0	\$0		
Quantity per Truck Load (Yds ³)	20	20	20	20	20	20		
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6	21.6	21.6		Based on avg 80lbs per cf
Unloading Cost	\$0	\$0	\$0	\$0	\$0	\$0		
Licensed Site Disposal Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0		
TOTAL TRANSPORT & DISPOSAL COST	\$31,256	\$153,137	\$22,208	\$8,260	\$0	\$3,479	\$218,339	
TOTAL BUILDING DEMO & DISPOSAL COST	\$102,279	\$1,090,637	\$98,912	\$10,947	\$616	\$4,274	\$1,307,665	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 3
SOIL REMOVAL & DISPOSAL

Cost Item	Nichols Mine Unit						Notes
	Office & Laboratory	Main Process Building	Maintenance Building	Header Houses, Manifold & Fuel Island Pad	Deep Disposal Well Bldgs.	Sub Total	
SOIL EXCAVATION, TRANSPORT & DISPOSAL							
Removal Under Building Footprints							
Excavation, Front End Loader	\$0	\$143	\$0	\$12	\$2		\$70.92/hr per WDEQ Guideline12 and 150 cy/hr (2016)
Quantity to be Shipped (Ft ³)	0	7,425	0	642	126		Assume removal of 3" of Contaminated Soil under structures where concrete foundations required decontamination, Disposal at a Licensed facility (ft3) (quantity based on area of concrete pad provided on worksheet 2b and multiplied by 0.25 inches)
Weight in Tons	0	371.25	0	32.08	6.3		
Quantity per Truck Load (Ton)	21.6	21.6	21.6	21.6	21.6		
Number of Truckloads	0.0	17.2	0.0	1.5	0.3		Partial loads will be combined to make a full load: Landfill loads = 0, License Facility loads = 19.8
Distance (Miles)	1330	1330	1330	1330	1330		Round Trip
Transportation Cost	\$0	\$70,898	\$0	\$6,125	\$1,203		
Disposal Cost (\$)	\$0	\$57,637	\$0	\$4,980	\$978	\$63,594	
Unloading Cost	\$0	\$13,342	\$0	\$1,153	\$226	\$14,721	
TOTAL SOILS EXC., TRANSPORT & DISPOSAL	\$0	\$70,978	\$0	\$6,132	\$1,204	\$78,315	

TOTAL SOIL REMOVAL & DISPOSAL COST	\$0	\$71,121	\$0	\$6,145	\$1,207	\$78,473	
---	------------	-----------------	------------	----------------	----------------	-----------------	--

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 4 --
Well and Delineation Hole Abandonment

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
Number of Wells	685	166		Includes injection, recovery and monitor wells. See Worksheet 1, No.1, Plus 1 Plant water well and 1 domestic well. Added wells for PA#2
Average Depth (ft)	550	550		
Average Diameter (inch)	5	5		
Area of Annulus (ft ²)	0.1364	0.1364		
Materials				
Bentonite Chips Required (Ft ³ /Well)	40.9	40.9		300 feet of clay above water
Bags of Chips Required/Well	55	55		
Cost/Well Bentonite Chips	\$292	\$292		
Gravel Fill Required (Ft ³ /Well)	34	34		Avg depth less 300 feet filled w/ gravel
Cost/Well Gravel Fill	\$23	\$23		
Total Materials Cost per Well	\$314	\$314		
Labor				
Hours Required per Well	2	2		
Total Labor Cost per Well	\$33	\$33		
Equipment Rental				
Hours Required per Well	1	1		Backhoe and operator
Total Equipment & Operation Cost per Well	\$43	\$43		
Total Cost per Well	\$390	\$390		
WELL ABANDONMENT COST	\$267,389	\$64,798	\$332,187	
Number of Delineation Drill Holes	100			
Average Depth (ft)	675			
Sealing Drill Hole (ft)	\$ 3.30			
Site Grading/Contouring (per site)	\$ 55.00			
Capping - precast concrete cap (ea)	\$ -			Per Chpt 8 Noncoal rules and regulations a concrete cap or dry nonslurry materials may be used and is account for in sealing drill hole
Cost Per drill hole	\$ 2,227.50			
Mobilization	\$ 1,100.00			
Delineation Drill Hole Abandonment	\$229,350			
TOTAL WELL & DELINEATION ABANDONMENT COST	\$561,537			

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 5, No. 1 --
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
I Wellfield Piping				
A. Removal				
Total Number of Wells	617	121		Includes injection and recovery wells. See Worksheet 1, No. 1
Feeder lines from HH to Injection wells 1" HDPE (Ft)	160,000	32,000		8 header houses & 1 HH for PA#2
Pregnant solution feeder lines from production wells to HH 1" HDPE (Ft)	86,800	16,000		8 header houses & 1 HH for PA#2
Total Quantity of 1" HDPE Piping (Ft)	246,800	48,000		
Plastic Volume (Ft ³)	809.37	157.33		Thickness Based on WL Plastics Corp PSI 160 (R1=.05479', R2=.04425')
Chipped Volume Assuming 30% Void Space (Ft ³)	1,052.18	204.53		
Disposal Weight (tons)	42.09	8.18		
Quantity per Truck Load (Tons)	21.6	21.6		Based on 20 cy per truckload and 80lbs per cf
Total Number of Truck Loads	2	0.4		Partial loads will be combined to make a full load: Landfill loads = 0, License Facility loads = 2
Total Length of Feeder line Trench (Ft)	30,850	4,000		Includes Shared Trenches - 8 header houses
Total Cost for Trunkline Removal	\$80,210	\$10,400		
Total Cost - Removal	\$80,210	\$10,400	\$90,610	
B. Survey & Decontamination				
Percent Requiring Decontamination	0	0		No survey or decon needed. Total volume to disposal
Loads for Decontamination	0	0		
Cost for Decontamination (\$/Load)	\$1,714	\$1,714		ERG (2016)
Cost for Decontamination	\$0	\$0	\$0	
C. Transport & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped	0%	0%		
Loads to be Shipped	0	0		
Distance (Miles)	150	150		Round Trip
Transportation Cost	\$0	\$0	\$0	
b. Disposal				
Yds ³ per Load	20	20		
Disposal Cost	\$0	\$0		
Total Cost - Landfill	\$0	\$0	\$0	
2.) Licensed Site				
a. Transportation				
Percent to be Shipped	100%	100%		
Loads to be Shipped	2	1		
Tons to be Shipped	42.09	8.18		
Distance (Miles)	1330	1330		Round Trip
Transportation Cost	\$8,037	\$1,562		
b. Disposal				
Disposal Cost	\$6,534	\$1,270		
Unloading Cost	\$92	\$47		
Total Cost - Licensed Site	\$14,663	\$2,880		
Total Cost - Transport & Disposal	\$14,663	\$2,880		
Total Cost - WF Piping Removal & Disposal	\$94,873	\$13,280	\$108,153	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 5, No. II

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
II Production Well Pumps				
A. Pump and Tubing Removal				
Number of Production Wells	220	40		From Worksheet 1 No I.
Cost of Removal	\$10,019	\$1,822		
Number of Pumps per Truck Load	180	180		
Weight of Pumps (lbs)	12540	2280		Assume 57 lbs/pump
Disposal Weight (Tons)	6.27	1.14		
Number of Truck Loads (Pumps)	1.22	0.22		Assume 20 T per truck
B. Survey & Decontamination (Pumps)				
Percent Requiring Decontamination	0%	0%		no survey as all to 11e2 licensed facility
Loads for Decontamination	0.00	0.00		
Cost for Decontamination	\$0	\$0		
C. Tubing Volume Reduction & Loading				
Length per Well (Ft)	300	300		
Total Quantity (Ft)	66000	12000		
Disposal Weight (tons)	11	2		
Quantity per Truck Load (Tons)	21.6	21.6		
Number of Truck Loads	0.52	0.09		
D. Transport & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped (Pumps)	0%	0%		
Loads to be Shipped	0.0	0.0		
Distance (Miles)	150	150		Round trip
Transportation Cost	\$0	\$0		
b. Disposal				
Quantity per Truck Load (Yds ³)	20	20		
Quantity per Truck Load (Tons)	21.6	21.6		
Disposal Cost	\$0	\$0		
Total Cost - Landfill	\$0	\$0		
2.) Licensed Site				
a. Transportation				
Percent to be Shipped (Pumps)	100%	100%		
Percent to be Shipped (Tubing)	100%	100%		
Loads to be Shipped	1.74	0.32		Total loads this page: Landfill loads = 0, License Facility loads = 2.5. Partial loads will be combined to make a full load.
Distance (Miles)	1330	1330		Round Trip
Transportation Cost	\$7,184	\$1,306		
b. Disposal				
Disposal Cost	\$270	\$49		
Unloading Cost	\$1,352	\$246		
Disposal Cost	\$1,622	\$295		
Total Cost - Licensed Site	\$8,807	\$1,601		
Total Cost - Transport & Disposal	\$8,807	\$1,601		
Total Cost - Pump Removal & Disposal	\$18,826	\$3,423	\$22,249	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 5, No. III
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
III Buried Trunkline				
A. Removal				
Length of Trunkline Trench (ft)	8916	844		more than one trunkline occupies a trench
Total Cost for Trunkline Removal	\$23,181.65	\$2,193.41	\$25,375.06	
4" HPDE Trunkline				The various trunklines in this section represent the trunklines going from the CPP to the header houses and back.
Piping Length (ft)	2,200	0		
Chipped Volume per foot of pipe (ft3/ft)	0.385	0.385		
Chipped Volume (ft3)	847	0		
6" HPDE Trunkline				
Piping Length (ft)	3,400	0		
Chipped Volume per foot of pipe (ft3/ft)	0.083	0.083		
Chipped Volume (ft3)	284	0		
8" HPDE Trunkline				
Piping Length (ft)	800	1,600		
Chipped Volume per foot of pipe (ft3/ft)	0.141	0.141		
Chipped Volume (ft3)	113	226		
10" HPDE Trunkline				
Piping Length (ft)	4,600	300		
Chipped Volume per foot of pipe (ft3/ft)	0.220	0.220		
Chipped Volume (ft3)	1,010	66		
14" HPDE Trunkline				
Piping Length (ft)	3,000	0		
Chipped Volume per foot of pipe (ft3/ft)	0.372	0.372		
Chipped Volume (ft3)	1,117	0		
Total Chipped Volume (ft3)	3,370	291		
Disposal Tons	14	1		8.315lb/ft per WL Plastics
Quantity per Truck Load (Tons)	21.6	21.6		
Total Number of Truck Loads	1	1		
B. Survey & Decontamination				
Percent Requiring Decontamination	0	0		No survey or decon needed. Total volume to low level disposal
Loads for Decontamination	0	0		
Cost for Decontamination (\$/Load)	\$1,714	\$1,714		ERG (2016)
Cost for Survey & Decontamination	\$0	\$0		
C. Transportation & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped	0%	0%		
Loads to be Shipped	0	0		
Distance (Miles)	150	150		Round Trip
Transportation Cost	\$0	\$0		
b. Disposal				
Yds ³ per Load	20	20		
Disposal Cost	\$0	\$0		
Total Cost - Landfill	\$0	\$0		
2.) Licensed Site				
a. Transportation				
Percent to be Shipped	100%	100%		
Loads to be Shipped	1	1		Total loads this page: Landfill loads = 0, License Facility loads = 4. Partial loads will be combined to make a full load.
Tons to be Shipped	14	1		
Distance (Miles)	1330	1330		Round Trip
Transportation Cost	\$2,676	\$231		
b. Disposal				
Disposal Cost	\$2,175	\$188		
Unloading Cost	\$776	\$776		
Total Cost - Licensed Site	\$4,851	\$420		
Total Cost Transportation & Disposal	\$4,851	\$420		
Total Cost - Buried Trunkline Removal & Disposal	\$28,033	\$2,613	\$25,375	

**Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation**

Worksheet 5, No. IV

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit Production Area #1 (PA#1)	Production Area #2 (PA#2)	Sub Total	Notes
IV Manholes				
A. Removal				
Total Quantity	8	2		
Total Cost of Removal (\$)	\$ 870.23	\$ 217.56	\$ 1,087.79	
Disposal Weight (Tons)	4.30	1.08		
Quantity per Truck Load (Tons)	21.6	21.6		Based on 20 cy per truckload and 80lbs per cf
Total Number of Truck Loads	0.20	0.05		
B. Survey & Decontamination				No survey or decon needed. Total volume to low level disposal
Percent Requiring Decontamination	0%	0%		
Loads for Decontamination	0	0		
Cost for Decontamination (\$/Load)	\$1,714	\$1,714		ERG (2016)
Cost for Survey & Decontamination	\$0	\$0	\$0	
C. Transportation & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped	0%	0%		
Loads to be Shipped	0	0		
Distance (Miles)	150	150		Round Trip
Transportation Cost	\$0	\$0		
b. Disposal				
Yds ³ per Load	20	20		
Disposal Cost	\$0	\$0	\$0	
Total Cost - Landfill	\$0	\$0		
2.) Licensed Site				
a. Transportation				
Percent to be Shipped	100%	100%		
Loads to be Shipped	0.20	0.05		Total loads this page: Landfill loads = 0, License Facility loads = 0.42. Partial loads will be combined to make a full load.
Tons to be Shipped	4.30	1.08		
Distance (Miles)	1330	1330		Round Trip
Transportation Cost	\$1,020	\$255		
b. Disposal				
Disposal Cost	\$668	\$167		
Unloading Cost	\$155	\$39		
Total Cost - Licensed Site	\$1,689	\$422		
Total Cost Transportation & Disposal	\$1,689	\$422		
Total Cost - Removal & Disposal	\$2,559	\$640	\$1,088	
TOTAL WELLFIELD EQUIPMENT REMOVAL & DISPOSAL COST	\$144,291	\$19,955	\$164,246	

**Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation**

Worksheet 6, No. 1

TOPSOIL REPLACEMENT & REVEGETATION

Cost Item	Plant only	Notes
I Process Plant and Office Building		
A. Topsoil Handling & Grading		
Affected Area (Acres)	5.2	
Average Affected Thickness (Inch)	6	
Topsoil Volume (Yds ³)	0	topsoil stockpiled on site for replacement no extra topsoil required
Sub Total - Topsoil	\$0	
Replacement soil (Tons)	371	from worksheet 3 (Assume removal of 3" of Contaminated subsoil soil under structures where concrete foundation required decontamination)
Respread Cost for area	\$161.20	
Sub Total - replacement soil	\$2,548	includes haul, placement and spread
B. Radiation Survey & Soil Analysis		
Sub Total - Survey & Analysis	\$8,878	
C. Revegation		
Grading (\$/Acre)	\$ 72.50	WDEQ-LQD Guideline 12A (Motor grader) 2016
Fertilizer (\$/Acre)	\$202.60	BF Construction (2015) (Tractor/disk)
Seeding Prep & Seeding (\$/Acre)	\$277.60	BF Construction (2015) seeding prep includes scarification (Tractor/disk)
Mulching & Crimping (\$/Acre)	\$587.60	BF Construction (2015) seeding prep includes scarification (Mulcher/crimper used)
Sub Total Cost/Acre	\$1,140.30	
Sub Total Revegation	\$5,906	
TOTAL PLANT AND OFFICE BUILDING		
TOPSOIL REPLACEMENT & REVEG COST	\$17,333	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 6, Nos. II & III
TOPSOIL REPLACEMENT & REVEGETATION

Cost Item	Mining Unit		Sub Total	Notes
	Production Area #1 (PA#1)	Production Area #2 (PA#2)		
II Wellfields				
A. Topsoil Handling & Grading				
Affected Area (Acres)	7	0.22		
Average Affected Thickness (Inch)	6	6		Mine Plan
Topsoil Volume (Yds ³)	0	0		Topsoil stockpiled onsite no replacement cost needed
Sub Total - Topsoil	\$0	\$0		
Replacement soil (Tons)	38.38	6.30		from worksheet 3 (Assume removal of 3" of Contaminated subsoil soil under structures where concrete foundation required decontamination)
Sub Total - replacement soil	\$246.75	\$40.51		
B. Radiation Survey & Soil Analysis				
Sub Total - Survey & Analysis	\$12,518	\$381		
C. Spill Cleanup				
Affected Area (Acres)	0.07	0		calculated that 10% of the affected acreage may require cleanup. No spills assumed in PA#2 as not in production.
Affected Area (Ft ²)	3049	0		
Affected Area Thickness (Ft)	0.25	0.25		
Affected Volume (Ft ³)	762.3	0		
Quantity per Truckload (Ft ³)	540	540		
Quantity to be Shipped (Loads)	1.4	0		Partial loads from Worksheet 5/IV would be applied to a partial load from this worksheet.
Distance (Miles)	1330	1330		Round Trip
Transportation Cost	\$5,823	\$0		
Handling Cost	\$314	\$0		
Disposal Cost	\$11,046	\$0		
Sub Total - Spill Cleanup	\$17,183	\$0		
D. Revegetation				
Grading (\$/Acre)	\$ 72.50	\$ 72.50		WDEQ-LQD Guideline 12A (Motor grader)2016
Fertilizer (\$/Acre)	\$202.60	\$202.60		BF Construction (2015)
Seeding Prep & Seeding (\$/Acre)	\$277.60	\$277.60		BF Construction (2015) cost includes scarification
Mulching & Crimping (\$/Acre)	\$587.60	\$587.60		BF Construction (2015)
Sub Total Cost/Acre	\$1,140	\$1,140		
Sub Total Revegetation	\$8,408	\$254		
Sub Total - Wellfields	\$38,355	\$635		
TOTAL WELLFIELDS COST	\$38,355	\$635	\$38,989	

III Roads				
A. Topsoil Handling & Grading				
Affected Area (Acres)	4.14	0.43		2500 feet by 60 feet wide
Average Affected Thickness (Ins)	6	6		
Topsoil Volume (Yds ³)	0	0		Topsoil stockpiled onsite no replacement cost needed
Sub Total - Topsoil	\$0	\$0		
B. Radiation Survey & Soil Analysis				
Sub Total - Survey & Analysis	\$7,102	\$738		
C. Revegetation				
Grading (\$/Acre)	\$72.50	\$72.50		WDEQ-LQD Guideline 12A (Motor grader) 2016
Fertilizer (\$/Ac)	\$202.60	\$202.60		BF Construction (2015) (Tractor/disk)
Seeding Prep & Seeding (\$/Ac)	\$277.60	\$278		BF Construction (2015) seeding prep includes scarification (Tractor/disk)
Mulching & Crimping (\$/Ac)	\$587.60	\$588		BF Construction (2015) seeding prep includes scarification (Mulcher/crimper used)
Sub Total Cost/Acre	\$1,140	\$1,140		
Sub Total Revegetation	\$4,725	\$491		
D. Disposal of Road Material to Landfill				removal of constructed road materials
Excavation, CAT (\$/ft of road)	\$1.73	\$1.73		WDEQ-LQD Guideline 12A (2016)
Feet of Road	2,500	313		
Weight in Tons	1	0.2		
Quantity per Truck Load (Ton)	21.6	21.6		
Excavation Cost	\$4,317.50	\$539.69		
Number of Truckloads	0.1	0.01		Total loads this page: Landfill loads = 0.11, License Facility loads = 0. Partial loads will be combined to make a full load.
Distance (Miles)	150	150		Total Loads worksheets (2a, 2b, 3, 5I, 5II, 5III, 5IV, 6 II&III): Landfill = 154, License Facility= 35
Transportation Cost	\$33.42	\$4.18		
Disposal Fee (\$/Ton)	\$4,351	\$544		
Sub Total - Roads	\$16,178	\$1,229		
TOTAL ROADS COST	\$16,178	\$1,229	\$17,406	

Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation

Worksheet 6, Nos IV & V
TOPSOIL REPLACEMENT & REVEGETATION

Cost Item	Mining Unit		Sub Total	Notes
	Other			
IV Other				
A. Topsoil Handling & Grading				
Affected Area (Acres)	5.97	0		11e2 Byproduct staging area DDW pads, manifold, silo area
Average Affected Thickness (Inch)	6	6		
Topsoil Volume (Yds ³)	0	0		Topsoil stockpiled onsite no replacement cost needed
Sub Total - Topsoil	\$0	\$0		
Replacement soil (Tons)				
Sub Total - replacement soil	\$0	\$0		
B. Radiation Survey & Soil Analysis				
Unit Cost (\$/Acre)	\$1,714	\$1,714		Based on ERG (2016)
Sub Total - Survey & Analysis	\$10,232.58	\$0		
C. Revegation				
Grading (\$/Acre)	\$ 72.50	\$72.50		WDEQ-LQD Guideline 12a (Motor grader)2016
Fertilizer (\$/Ac)	\$202.60	\$202.60		BF Construction (2015) (Tractor/disk)
Seeding Prep & Seeding (\$/Acre)	\$277.60	\$277.60		BF Construction (2015) seeding prep includes scarification (Tractor/disk)
Mulching & Crimping (\$/Acre)	\$587.60	\$587.60		BF Construction (2015) seeding prep includes scarification (Mulcher/crimper used)
Sub Total Cost/Acre	\$1,140.30	\$1,140.30		
Sub Total Revegation	\$6,808	\$0		
Sub Total - Other	\$17,040	\$0		
TOTAL OTHER COST	\$17,040	\$0	\$17,040	
TOTAL TOPSOIL REPLACEMENT & REVEGETATION COST (Total of 7I through 7V)	\$88,905	\$1,863	\$90,769	

**Surety Estimate
First Year of Operation
Nichols Ranch ISR Project
Uranerz Energy Corporation**

Worksheet 7, Nos I - VII

MISCELLANEOUS RECLAMATION

Cost Item		Mining Unit		Sub Total	Notes
		Nichols #1	Nichols #2		
I	Fence Removal & Disposal				
	Quantity (Ft)	8,558	2,347		
	Cost of Removal/Disposal (\$)	\$3,577	\$981	\$4,558	
II	Powerline Removal & Disposal				
	Quantity (Ft)	160,460	136,810		Power to Wells, header houses. Other power already in place by CBM companies
	Cost of Removal/Disposal (\$/Ft)	\$0	\$0		Lines buried in pipe trenches. Excavation costs covered on Sheets 6I and 6III. Assume salvage of wire at no cost.
	Cost of Removal/Disposal (\$)	\$0	\$0	0	
III	Transformer Removal & Disposal				
	Quantity	0	0		Tri-County Electric will remove at no cost, WDEQ Guideline No.12, App. H
	Cost of Removal/Disposal (\$/Each)	0	0		
	Cost of Removal/Disposal (\$)	0	0	0	
IV	Culvert Removal & Disposal				
	Quantity (Ft)	307	130		
	Cost of Removal/Disposal (\$)	\$1,517	\$642	\$2,159	
V	Guardrail Removal				
	Quantity (Ft)	0	0		None
	Cost of Removal/Disposal (\$/Ft)	\$0.00	\$0.00		
	Cost of Removal/Disposal (\$)	\$0	0	0	
VI	Low Water Stream Crossing				
	Quantity	0	0		None
	Cost of Removal/Disposal (\$/Each)	\$0	\$0		
	Cost of Removal/Disposal (\$)	\$0	\$0	0	
	TOTAL MISCELLANEOUS COST	\$5,094	\$1,623	\$6,717	

Master Costs

Analytical Costs				Profit &	
Excursion (UCL) Parameters				Overhead¹	Source
Guideline No. 8	Rate (\$)	CPI*	Units	included	analysis IML (2016)
DDW Monitoring	\$ 30.00	NA	analysis	included	analysis IML (2016)
Radiation Survey - Ground	\$ 322.00	NA	acre	included	ERG (2016)
	\$ 474.00	NA			
	\$ 1,714.00	NA			
Capital Costs				Profit &	Source
Reverse Osmosis Unit (500 gpm)	Rate (\$)	CPI*	Units	Overhead ¹	
	\$ 500,000	\$517,500	each	included	
Chemical and Material Costs				Profit &	Source
Antiscalant	Rate (\$)	CPI*	Units	Overhead ¹	GE Water & Process Technologies (2016)
Hydrochloric Acid	\$ 0.609	NA	kgal	included	Operating Experience (2016)
Bentonite Chips	\$ 0.01	NA	kgal	included	Casper Well
Gravel	\$ 5.30	NA	bag	included	Casper Well
Cement Cone	\$ 18.00	NA	cy	included	Casper Well
	\$ 6.76	NA	each	included	Casper Well
Equipment Costs				Profit &	Source
	Rate (\$)	CPI*	Units	Overhead ¹	
	\$ 500,000	\$517,500	each	included	
Utility Costs				Profit &	Source
Electrical	Rate (\$)	CPI*	Units	Overhead ¹	
Kilowatt to Horsepower	\$ 0.06	NA	kWhr	included	Powder River Energy (2016)
Efficiency - Downhole Pumps	0.746	NA	Kw/HP	included	
Efficiency - Surface Pumps	80%	NA	percent	included	
Propane - Plant & Office	90%	NA	percent	included	
	\$ 3,838.00	NA	month	included	Blakeman Propane (2016)
Quoted Costs				Profit &	Source
Wellfield Pipeline Removal	Rate (\$)	CPI*	Units	Overhead ¹	
Trunk Line Removal	\$ 2.60	NA	ft - trench	included	Wind Creek (2014)
Revegetation Costs-Seed (includes scarification)	\$ 2.60	NA	ft - trench	included	Wind Creek (2014)
Revegetation Costs-Mulch	\$ 277.60	NA	acre	included	BF Construction (2015)
Revegetation Costs-Fertilizer	\$ 587.60	NA	acre	included	BF Construction (2015)
Revegetation Costs-Total	\$ 202.60	NA	acre	included	BF Construction (2015)
	\$ 1,067.80	NA	acre	included	BF Construction (2015)
Waste Transportation & Disposal Costs				Profit &	Source
C&D Debris Transportation	Rate (\$)	CPI*	Units	Overhead ¹	
C&D Debris Disposal	\$ 0.18	NA	ton-mile	included	Contract (2016)
11e.(2) Byproduct Material Transportation	\$ 47.00	NA	ton	included	Contract (2016)
11e.(2) Byproduct Material Disposal	\$ 0.14	NA	ton-mile	included	Contract (2016)
11e.(2) Byproduct Material Disposal	\$ 135.00	\$ 139.73	ton	included	Contract (2016)
11e.(2) Byproduct Material Unloading	\$ 150.00	\$ 155.25	ton	included	Contract (2016)
11e.(2) Byproduct Material Disposal (Type I)	\$ 750.00	\$ 776.25	load	included	Contract (2016)
11e.(2) Byproduct Material Disposal (Type II)	\$ 180.00	\$ 186.30	ton	included	Contract (2016)
11e.(2) Byproduct Material Disposal (Type II)	\$ 180.00	\$ 186.30	ton	included	Contract (2016)
11e.(2) Byproduct Material Disposal - soil	\$ 350.00	\$ 362.25	ton	included	Contract (2016)
Topsoil Haul/Place	\$ 6.43	NA	cy	included	71 Soil & Rock (2015)
Other				Profit &	Source
Plant Repair and Maintenance	Rate (\$)	CPI*	Units	Overhead ¹	
Wellfield Repair and Maintenance	\$ 0.07	NA	kgal	included	Operating Experience (2016)
DDW Repair and Maintenance	\$ 0.07	NA	kgal	included	Operating Experience (2016)
DDW Plug and Abandonment	\$ 0.14	NA	kgal	included	Operating Experience (2016)
Equipment Decontamination	\$ 96,416.00	NA	well	\$ 106,058	UIC 10-392 Permit (evaluated during 5 yr review by WQD)
Equipment Dismantling and Loading	\$ 3.78	NA	ft2	included	RS Means 2016 Building Construction Costs Data
Equipment Oversize Charge	\$ 7.70	NA	ft2	included	RS Means 2016 Building Construction Costs Data
Concrete Decontamination	\$ 414.00	\$ 428.49	load	\$ 456.85	RS Means 2016 Building Construction Costs Data
Well Pump and Tubing Removal	\$ 1.02	NA	ft2	included	Operating Experience (2016)
Handling spill clean up soil	\$ 41.40	\$ 45.54	well	\$ 45.54	
	\$ 202.00	\$ 209.07	load	\$ 222.20	
Labor Costs				Benefits	Source
Supervisor	Rate (\$)	CPI*	Units	hour	Building Construction Prevailing Wages (2/16/16)
Operator	\$ 25.13	NA	hour	\$ 30.67	Building Construction Prevailing Wages (2/16/16)
Maintenance	\$ 20.70	NA	hour	\$ 24.67	Building Construction Prevailing Wages (2/16/16)
Laborer	\$ 18.87	NA	hour	\$ 21.44	Building Construction Prevailing Wages (2/16/16)
	\$ 16.38	NA	hour	\$ 16.38	Building Construction Prevailing Wages (2/16/16)
WDEQ/LQD Guideline No. 12 Costs				Profit &	Source
Vehicle Operation	Rate (\$)	CPI*	Units	Overhead ¹	
Backhoe w/out Operator (\$/Hr)	\$ 12.49	NA	hour	\$ 13.74	Guideline (5/2016)
Loader (5.25 Cy)	\$ 19.93	NA	hour	\$ 21.92	Guideline (5/2016)
Grading Operating Costs	\$ 70.92	NA	acre	\$ 78.01	Guideline (5/2016)
Fencing Removal	\$ 65.91	NA	acre	\$ 72.50	Guideline (5/2016)
Culvert Removal	\$ 0.38	NA	foot	\$ 0.42	Guideline (5/2016)
Culvert Removal	\$ 4.94	NA	foot	\$ 5.43	Guideline (5/2016)
Building Demolition - Mixture of Types	\$ 98.89	NA	20 ft CMP	\$ 108.78	Guideline (5/2016)
Building Demo Disposal (Average)	\$ 0.295	NA	ft3	\$ 0.32	Guideline (5/2016)
Concrete (Floor) Demolition - 6" Thick with Rebar	\$ 9.71	NA	cy	\$ 10.68	Guideline (5/2016)
Concrete (Footing) Demolition - 2' Thick, 3' Wide	\$ 0.320	NA	ft2	\$ 0.35	Guideline (5/2016)
Drill Hole Abandonment: Wet Exploration Holes >25 holes	\$ 0.76	NA	linear foot	\$ 0.84	Guideline (5/2016)
Incidental Costs: Small Site Grading and Seeding (<1000 sq. feet)	\$ 3.00	NA	foot	\$ 3.30	Guideline (5/2016)
Incidental Costs: Location Fee	\$ 50.00	NA	hole	\$ 55.00	Guideline (5/2016)
Incidental Costs: Mobilization	\$ 10.00	NA	project	\$ 1,100.00	Guideline (5/2016)
Topsoil Respread (Cat 627)	\$ 1,000.00	NA	acre	\$ 0.87	Guideline 12A
Grading (Motor Grader)	\$ 0.79	NA	cy	\$ 0.87	Guideline 12A
Excavation (Cat)	\$ 65.91	NA	acre	\$ 72.50	Guideline 12A
	\$ 1.57	NA	ft	\$ 1.73	Guideline 12A

¹ Per WDEQ/LQD Guideline 12, Section II(B)(12)(b)

*US DEPT. of CONSUMER PRICE INDEX ADJUSTMENT 2013 to 2016

3.50%

Consumer Price Index Multiplier (2013 to 2016)

1.0350