



## **APPENDIX L**

### **Restoration and Reclamation Cost Estimate**



## Land Application

**Summary  
Closure Cost Estimate  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>No.</b>	<b>Cost Item</b>	<b>Cost</b>
1	Water Treatment Equipment (provided with initial project construction)	-
2	Groundwater Restoration Cost	2,387,000
3	Well Closure	490,000
4	Decommissioning Labor	706,000
5	Mobilization and Site Preparation	25,000
6	Demolition and Disposal of 11e(2)	1,489,000
7	Plant Equipment Transferred	239,000
8	Demolition with Disposal in Landfill	2,520,000
9	Other Reclamation	1,989,000
10	Contingency at 15%	1,477,000
	<b>Total Restoration and Reclamation Cost</b>	<b>11,322,000</b>

**Closure Costs by Year**  
**Dewey Burdock ISL Mine**  
**Powertech Uranium Corporation**

	2010	2011	2012	2013	2014	2015	2016	Total
<b>Production (lbs U3O8)</b>		1,000,000	8,411	-	-	-	-	
Restoration Flow - Dewey (gpm)			250					
Restoration Flow - Burdock (gpm)			250					
<b>Capital Cost</b>								
Restoration Equipment	-	-						-
								-
<b>Operations</b>								
Labor	-	81,000	811,000	189,000	81,000			1,162,000
Electricity			574,320					574,000
Chemicals	-	-	8,500	-	-	-	-	9,000
Maintenance			297,471					297,000
Byproduct Disposal			4,206					4,000
Monitoring	-	-	157,986	183,292				341,000
								<b>2,387,000</b>
<b>Decommissioning</b>								
Well Closure					-	245,000	245,000	490,000
Labor (included above)						353,000	353,000	706,000
Mob/Site Preparation						25,000		25,000
Demo and Disposal - 11 e(2)						744,500	744,500	1,489,000
Equipment Transferred						119,500	119,500	239,000
Demo and Disposal - Landfill						1,260,000	1,260,000	2,520,000
Other Reclamation						994,500	994,500	1,989,000
								<b>7,458,000</b>
<b>Contingency</b>								
Contingency at 15%	-	12,150	278,023	55,844	12,150	561,225	557,475	1,477,000
								<b>1,477,000</b>
<b>Total Costs</b>	-	93,150	2,131,506	428,135	93,150	4,302,725	4,273,975	11,322,000

**Restoration Equipment  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Description		Equipment List Number	No./Size	Quantity	Units	Unit Cost	Purchase Cost	Shipping Cost	Estimated Capital Cost
	Restoration System								
	Restoration IX Vessel (118,600 ea + 15k distributor + 8k delivery)	300-IX-001A, B		2	each	0	0	0	0
	IX resin - Dowex 21K XLT	NA	2	500	cu ft	0	0	0	0
	PC Booster Pump (250 gpm; 90' TDH)	300-P-001 A, B, C		2	each	0	0	0	0
	IC Booster Pump	300-P-002 A, B, C		2	each	0	0	0	0
	RO Sump Pump	300-P-011, spare		0	each	0	0	0	0
	RO Skid (Incl pretrmt, filtration and feed pump) 500 gpm	300-RO-001		0	each	0	0	0	0
<b>Estimated Restoration Equipment - Subtotal:</b>									<b>0</b>

**Restoration Labor  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Labor		2009	2010	2011	2012	2013	2014	2015	2016
<b>Geology</b>									
	Senior Project Geologist	1	1	1					
	Project Geologists	2	4	4					
	Drafting Technicians	1	3	3					
	<b>Subtotal</b>								
<b>Construction/Drilling</b>									
	Construction Superintendent		1	1				0	0
	Drilling Foreman		1	1					
	Drilling Services Leadman		1	1			0	0	0
	Drilling Services Technicians		6	6			0	0	0
	Logging and MIT Technicians		7	7					
	Drilling Supervisor		1	1					
	Wellfield Construction Foreman		1	1					
	General Construction Technicians		8	4		0	0	4	4
	Electrical/Instrumentation		2	2					
	Heavy Equipment		4	2			0	2	2
	Construction Engineer		1	1			0	1	1
	<b>Subtotal</b>								
<b>Production</b>									
	Production Superintendent			1					
	Wellfield Operations Supervisor			1					
	Wellfield Engineer			1					
	Wellfield/Satellite Operations Leadman			1					
	Wellfield/Satellite Operators			12	4	0			
	Restoration Engineer			1	1	1	1		
	Restoration Operator				1	0	0		
	Groundwater Sampling Technician	1	2	2	0	0	0		
	Groundwater Sampling Technician				2	2	0		
	Central Plant Operations Supervisor			1	1	0	0		
	Central Plant Operations Leadman			1					
	Central Plant Operators			4	1	0	0		
	Central Plant Operators - Day			4					
	Dryer Operators			2					
	Chemist/Lab Supervisor			1					
	Lab Technicians			4	1	0	0		
	Maintenance Supervisor			1					
	General Maintenance Techs			4	1	0	0		
	Mechanics			3					
	Electrical/Instrumentation			2	1	0	0		
	<b>Subtotal</b>								
<b>Unit Labor Costs</b>									
<b>Geology</b>				0	0	0	0	0	0
	Senior Project Geologist	135,000	135,000	135,000	0	0	0	0	0
	Project Geologists	95,000	380,000	380,000	0	0	0	0	0
	Drafting Technicians	54,000	162,000	162,000	0	0	0	0	0
	<b>Subtotal</b>			0	0	0	0	0	0
<b>Construction/Drilling</b>				0	0	0	0	0	0
	Construction Superintendent	135,000	135,000	135,000	0	0	0	0	0
	Drilling Foreman	95,000	95,000	95,000	0	0	0	0	0
	Drilling Services Leadman	81,000	81,000	81,000	0	0	0	0	0
	Drilling Services Technicians	54,000	324,000	324,000	0	0	0	0	0
	Logging and MIT Technicians	54,000	378,000	378,000	0	0	0	0	0
	Drilling Supervisor	68,000	68,000	68,000	0	0	0	0	0
	Wellfield Construction Foreman	68,000	68,000	68,000	0	0	0	0	0
	General Construction Technicians	41,000	328,000	164,000	0	0	0	164,000	164,000
	Electrical/Instrumentation	81,000	162,000	162,000	0	0	0	0	0
	Heavy Equipment	54,000	216,000	108,000	0	0	0	108,000	108,000
	Construction Engineer	81,000	81,000	81,000	0	0	0	81,000	81,000
	<b>Subtotal</b>			0	0	0	0	0	0
<b>Production</b>				0	0	0	0	0	0
	Production Superintendent	135,000	0	135,000	0	0	0	0	0
	Wellfield Operations Supervisor	95,000	0	95,000	0	0	0	0	0
	Wellfield Engineer	81,000	0	81,000	0	0	0	0	0
	Wellfield/Satellite Operations Leadman	68,000	0	68,000	0	0	0	0	0
	Wellfield/Satellite Operators	54,000	0	648,000	216,000	0	0	0	0
	Restoration Engineer	81,000	0	81,000	81,000	81,000	81,000	0	0
	Restoration Operator	68,000	0	0	68,000	0	0	0	0
	Groundwater Sampling Tech	54,000	54,000	108,000	0	0	0	0	0
	Groundwater Sampling Tech	54,000	0	0	108,000	108,000	0	0	0
	Central Plant Operations Super	122,000	0	122,000	122,000	0	0	0	0
	Central Plant Operations Leadman	81,000	0	81,000	0	0	0	0	0
	Central Plant Operators	54,000	0	216,000	54,000	0	0	0	0
	Central Plant Operators - Day	54,000	0	216,000	0	0	0	0	0
	Dryer Operators	54,000	0	108,000	0	0	0	0	0
	Chemist/Lab Supervisor	95,000	0	95,000	0	0	0	0	0
	Lab Technicians	47,000	0	188,000	47,000	0	0	0	0
	Maintenance Supervisor	61,000	0	61,000	0	0	0	0	0
	General Maintenance Techs	41,000	0	164,000	41,000	0	0	0	0
	Mechanics	61,000	0	183,000	0	0	0	0	0
	Electrical/Instrumentation	74,000	0	148,000	74,000	0	0	0	0
	<b>Subtotal</b>								

	2009	2010	2011	2012	2013	2014	2015	2016
<b>Restoration and Reclamation Labor Cost</b>			81,000	811,000	189,000	81,000	353,000	353,000

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Description</b>		<b>Quantity</b>	<b>Units</b>
<b>General Operating Assumptions</b>			
1	Production objective	1,000,000	# of U3O8 per year
2	Ave. wellfield design based on # yellowcake per sq ft of ore reserve, equals:	1.60	lb/sq ft
3	ISR recovery efficiency of:	0.75	recovery efficiency
4	First Year production rate	0.91	pounds/yr/sq ft
	Average grade of producted water (ppm U3O8)		
5	Area required to meet production objective (online all the time)	911,458	sq ft
		21	acres
6	Area per pattern	10,000	sq ft/pattern
7	Number of online patterns required to meet production objective	91	patterns
8	Number of online Production Wells required to meet production objective	91	production wells
	Assuming 20 gpm/production well, total production flow rate equals:	1,823	gpm
	Assuming 350 days/yr pumping, average U3O8 grade to meet production objective equals:	130	ppm U3O8
	If total flowrate limited to 4,000 gpm, average grade to meet production objective equals:	59	ppm U3O8
9	I/R Ratio	1.6	inj wells/prod wells
10	Number of online Injection Wells required to meet objective	146	injection wells
11	Number of online Production Wells per Header House	18	production wells/HH
12	Number of HH required to meet production objective	5.1	HH
13	Number of Perimeter Monitoring Wells per Header House	2.0	monit wells/HH
14	Number of Internal Monitoring Wells per HH (1 upper +1 lower)	2.0	monit wells/HH
15	Number of Compliance Wells per HH (1300 LF spacing)	0.6	comp wells/HH
16	Subtotal # Monitor wells per HH during production	4.6	total mw/HH
17	Total # Monitoring wells per 1MM # produced during production	23.4	total MW

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
Assumed electricity rate incl demand charge (\$/kwh)	0.07				
<b>Wellfields</b>					
<b>Wells (per well)</b>					
Electric utilities:					
Production well pumps - 20 gpm @ 400 ft TDH	1	20,000	kwh	0.070	1,400
Wellhead heaters (0.5 kw, 180 days/yr)	1	2,000	kwh	0.070	100
<b>Subtotal Power</b>					<b>1,500</b>
<b>Header House (per HH)</b>					
Replacement flow meters (x%/yr)	10	1	ea	50	500
Replacement pressure gauges/switches	20	1	ea	50	1,000
Equip maintenance (@ 10% of new equipment capital)	1	80,000	%	0.10	8,000
<b>Subtotal Maintenance</b>					<b>9,500</b>
Electric utilities:					
Bldg heating (5 kw, 180 days/yr)	1	22,000	kwh	0.070	1,500
Instrumentation (1 kw)	1	9,000	kwh	0.070	600
<b>Subtotal Power</b>					<b>2,100</b>
<b>General well field area</b>					
Pipelines		1	lump sum	50,000	50,000
Road maintenance materials (gravel/culverts)		1	lump sum	10,000	10,000
Wireless telemetry and security systems maintenance		1	lump sum	2,000	2,000
<b>Subtotal Maintenance</b>					<b>62,000</b>
<b>Oxygen/Carbon Dioxide Injection</b>					
Oxygen gas per year		0	tons/yr	1,100	0
Carbon dioxide gas per year		0	tons/yr	1,160	0
<b>Subtotal Chemicals</b>					<b>0</b>
<b>Satellite Plant</b>					
Ion exchange resin replacement - DOWEX 21K XLT		0	cu ft	221	0
Electric utilities:					
PC Booster Pump	2	605,491	kwh	0.070	42,400
IC Booster Pump	2	605,491	kwh	0.070	42,400
Resin Transfer Pump	1	8,830	kwh	0.070	600
Utility Water Pump	1	11,773	kwh	0.070	800
HVAC		105,120	kwh	0.070	7,400
Lighting (0.8 W/ft <sup>2</sup> )	10000	52,560	kwh	0.070	3,700
Instrumentation (2 kw)	1	18,000	kwh	0.070	1,300
<b>Subtotal Power</b>					<b>12,400</b>
Resin Transport to CPP		6	R/T per yr	50	300

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
<b>Land Application</b> (assume 20% to wellfield production)					
Electric utilities 136 days/year (growing season May 11 - Sept 24):					
Land app pumps Dewey (849 gpm at assume 200' TDH)	1	207,509	kwh	0.07	14,500
Land app pumps Dewey (849 gpm at assume 200' TDH)	1	207,509	kwh	0.07	14,500
Center pivot hydraulic pump; 10 hp for 25 ac areas (use 8 RHP)	7	137,000	kwh	0.07	67,100
Center pivot hydraulic pump; 15 hp for 50 ac areas (use 13 RHP)	14	444,000	kwh	0.07	435,100
Sump pump at 25 ac land app site (return irrigation tailwater/runoff)	7	3,000	kwh	0.07	1,500
Sump pump at 50 ac land app site (return irrigation tailwater/runoff)	14	10,000	kwh	0.07	9,800
<b>Subtotal Power</b>					<b>543,000</b>
<b>Assume 81% to Well Field Restoration</b>					<b>439,830</b>
<b>Equipment Maintenance:</b>					
Center pivot machines	26	1	year	500	13,000
Equip Maintenance (@ 3% of new equipment capital) - pumps only		78,000	%	3	2,300
Equipment Replacement (@ 3% of new equipment capital)		1,464,000	%	3	43,900
<b>Subtotal Maintenance</b>					<b>59,000</b>
<b>Assume 81% to Well Field Restoration</b>					<b>47,790</b>
<b>Water Supply Power @65 gpm</b>					
Groundwater extraction (65 gpm; 400 TDH; 24 hr/day)	1	64,000	kwh	0.070	<b>4,000</b>
<b>Offsite Deep Disposal Well(s) @ 12 gpm</b>					
Trucking to Burns, WY (214 gal/day = 6 trips/year)	2	412	miles/RT	3.50	<b>17,000</b>
Injection pump maintenance and repair (assume 6% of cap cost)	1	150,000	Cap cost	0.06	<b>9,000</b>
<b>Electric utilities:</b>					
Deep disposal well PD pump (4, but only one operating)					
12 gpm@300 psi = 130 gpm @1000 TDH	1	1,000	kwh	0.070	100
Bldg heating (1 kw, 180 days/yr)	1	4,000	kwh	0.070	300
<b>Subtotal</b>					<b>0</b>
<b>Storage and Radium Settling Ponds</b>					
Electrical for transfer pumps (120 gpm @ 300" TDH)	1	88,000	kwh	0.07	<b>6,160</b>
Pond Maintenance (\$2,800/pond/yr)	1	11	year	2,800	<b>30,800</b>
<b>Subtotal</b>					<b>36,960</b>
<b>Equipment When Restoration Operations are underway (in addition to production)</b>					
<b>Header Houses</b>					
Equip maintenance (@ 3 % of new equipment capital)		0	%	0.03	0
<b>Subtotal</b>					<b>0</b>
<b>Electric utilities:</b>					
Bldg heating (5 kw, 180 days/yr)	5.0	108,000	kwh	0.070	7,600
Instrumentation (1 kw)	5.0	44,000	kwh	0.070	3,100
<b>Subtotal</b>					<b>10,700</b>
<b>Restoration</b>					
<b>Restoration Assumptions</b>					
Reclamation consists of 10 PV of activity		10	PVs		
Assume PV = area/1M pounds U3O8 recovered (see operating assumptions above) x 10 ft thick x 20% porosity x 1.5 flare factor x 7.48 gal/cu ft		20,453,125	gallons/M# recovered		
Unit volume required per 1M # recovered per year		1.14			
Volume of flush water required per year		233,165,625	gallons/yr		
Nomical restoration design flow rate (both sites)		500	gpm		
Years to Reclaim 1M pounds of U3O8 recovered		0.89	years		

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
<b>Treatment Chemicals</b>					
IX Cost (see KC Restoration Treatment Cost 10_9_08)			LS	1.000	8,500
<b>Subtotal</b>					<b>8,500</b>
<b>Treatment Maintenance</b>					
IX Resin Replacement - assume 4% of cap cost		225,000	cap cost	0.040	9,000
Process hardware maintenance + replmt @ 4% of Capital		994,000	cap cost	0.040	39,760
<b>Subtotal</b>					<b>49,000</b>
<b>Booster Pumps from CPP to Storage Ponds</b>					
Booster Pumps (2 - 250 gpm; 200 TDH; 24 hr/day)	2	245,000	kwh	0.070	17,000
<b>Water Supply Power</b>					
Groundwater extraction (500 gpm; 500 TDH; 24 hr/day)	1	612,000	kwh	0.070	43,000
<b>Well Field Power</b>					
Groundwater extraction (500 gpm; 400 TDH; 24 hr/day)	1	489,000	kwh	0.070	34,000
Treated water reinjection (500 gpm; 200 TDH; 24 hr/day)	1	245,000	kwh	0.070	17,000
<b>Subtotal</b>					<b>51,000</b>
<b>SubTotal Treatment and Power Cost</b>					<b>168,500</b>
<b>Land Application (see RTJ Estimate 10_19_08) (assume 81% to Restoration)</b>					
- Land Application design 620 gpm of annual flow (restoration = 500 gpm or 81% of design)					
Electric utilities 136 days/year (growing season May 11 - Sept 24):					
Land app pumps Dewey (849 gpm at assume 200' TDH)	1	415,000	kwh	0.07	29,100
Land app pumps Dewey (849 gpm at assume 200' TDH)	1	415,000	kwh	0.07	29,100
Center pivot hydraulic pump; 10 hp for 25 ac areas (use 8 RHP)	7	137,000	kwh	0.07	67,100
Center pivot hydraulic pump; 15 hp for 50 ac areas (use 13 RHP)	14	444,000	kwh	0.07	435,100
Sump pump at 25 ac land app site (return irrigation tailwater/runoff)	7	3,000	kwh	0.07	1,500
Sump pump at 50 ac land app site (return irrigation tailwater/runoff)	14	10,000	kwh	0.07	9,800
<b>Subtotal Power</b>					<b>572,000</b>
<b>Assume 81% to Well Field Restoration</b>					<b>463,320</b>
Equipment Maintenance:					
Center pivot machines	26	1	year	500	13,000
Equip Maintenance (@ 3% of new equipment capital) - pumps only		78,000	%	3	2,300
Equipment Replacement (@ 3% of new equipment capital)		1,464,000	%	3	43,900
<b>Subtotal Maintenance</b>					<b>59,000</b>
<b>Assume 81% to Well Field Restoration</b>					<b>47,790</b>

**Restoration  
Operation Maintenance  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

		<b>100x100 Grid</b>	<b>Units</b>
<b>Wellfield Maintenance (per MM # produced)</b>			
# Production wells		91	prod wells
# Injection wells		146	inj wells
Well maintenance (assume \$500/well)		119,000	\$/yr
Replacement of submersible pumps (say 10%/yr @ 2,000 each)		18,000	\$/yr
# Header houses (per MM # produced)		5.1	#HH/yr
Header House maintenance	9,500 per HH	48,450	\$/yr
<b>Restoration Assumptions and Cost</b>			
Years to Reclaim wellfields per 1M pounds of U3O8 recovered (see Operating Cost)		0.89	years
<b>Well Field and Treatment Operating Cost</b>			
Treatment Chemicals (see Operating Cost)		8,500	\$/yr
Treatment Maintenance (see Operating Cost)		49,000	\$/yr
Treatment Power (see Operating Cost)		17,000	\$/yr
Water Supply Power (see Operating Cost)		43,000	\$/yr
Water Supply pump replacement (10% of supply pump costs)	75000	7,500	\$/yr
Well Field Power (extraction and injection) (see Operating Cost)		51,000	\$/yr
Well maintenance (\$300/well)	300	71,000	\$/yr
Submersible pump replacement (10% of well field pump costs)		18,000	\$/yr
Well Field Piping Maintenance (assume 50,000/yr)		50,000	\$/yr
<b>Header House</b>			
Replacement meters, gages, and equip (see Operating Cost)	10,700 /HH	54,181	\$/yr
<b>Land Application</b>			
Power Cost (see Operating Cost)		463,320	\$/yr
Maintenance Cost (see Operating Cost)		47,790	\$/yr
<b>Restoration Operating Cost</b>		<b>511,110</b>	<b>\$/yr</b>
<b>Stability Monitoring/Decommissioning</b>			
Equipment Decommissioning (see Decommissioning worksheet)			
<b>Wellfield Decommissioning</b>			
Unit cost per well (assume ave depth of 650 feet)			
5" diameter casing =		0.136	CF/LF
Average well depth =		650	LF
Cubic ft per well =		88.4	CF
Cement grout cost =		9.00	\$/CF
Cement grout cost/well		795.60	\$/well
contractor labor w/ equipment = 4 crew-hr/well @ \$125/hr = \$500.		500	\$/well
Total abandonment cost/well (rounded) =		1,300	\$/well
Monitoring wells	#wells = 140	182,000	\$/LS
Production and Injection wells	#wells = 237	308,100	\$/LS
Piping, power, and HH (see Decommissioning worksheet)		-	\$/LS
<b>Total Wellfield Decommissioning</b>		<b>490,000</b>	<b>\$/LS</b>
<b>Well Decomm Cost per 1M# U</b>		<b>81,667</b>	<b>\$/M# U</b>

**Restoration Treatment Chemicals  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Chemicals:</b>										
Hydrogen peroxide - 50% solution	lb	0.30	\$/lb							
Sulfuric acid - 98%	lb	0.135	\$/lb							
Sodium hydroxide - 50% solution	lb	0.145	\$/lb							
Sodium chloride - all purpose food grade granular	lb	0.09	\$/lb							
Sodium carbonate	lb	0.135	\$/lb							
Barium chloride - dry powder	lb dihydrate	0.67	\$/lb							
Flocculant	gal	1	\$/lb							
O2	ton of gas	1,100	\$/ton							
CO2	ton of gas	1,160	\$/ton							
<b>Restoration Assumptions:</b>										
Flowrate:		500	gpm							
Uranium Concentration		5	ppm							
Uranium Concentration in IX tails		1	ppm							
Annual Production of Restoration Activities		8411	lb U3O8							
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cost of Chemicals										
Hydrogen peroxide - 50% solution			900							
Sulfuric acid - 98%			1100							
Sodium hydroxide - 50% solution			1100							
Sodium chloride			3400							
Sodium carbonate			1,000							
Barium chloride - dry powder			1,000							
Flocculant			0							
<b>Subtotal</b>			8,500	-	-	-	-	-	-	-

**ByProduct Disposal During Restoration  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Byproduct Waste During Operations</b>								
Restoration								
	RO waste and IX waste	Assume costs included in CPP	0			-		
	Well Field waste	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402
	PPE	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402
	Decon waste	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402
						-	<b>Subtotal</b>	<b>4,206</b>
* Assume Transport to Andrews, Texas @ 710 miles from Site. Assume \$3.50/loaded mile with 20 CY load, and \$1.85 /unloaded mile. Thus, \$2,485 per 20 CY.								
Therefore, use \$5.35 * 710 = \$3,000 per 20 CY. Decon truck cost = \$500/20 CY								

**Environmental Monitoring  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Ennironmental Monitoring		Number	Quantity	Units	Rate (\$)	Cost (\$/yr)								
<b>Met Station</b>	Assume 1 met station for Site	1	12	visits/yr	200	2400								
<b>Water Qual</b>														
	20 metals, mercury, alk, Cl, SO4, NO3, Fl, EC, pH, and TDS (Test America) @ \$350 (w/shipping)													
	Radionuclides - Ra-226+228, Gamma spec, Th, U, and gross A/B (Test America) @ \$550 (w/ shipping)													
	<b>Baseline:</b> Six quarterly samples from each perimeter + interior well + 1 production well per 8 acres for 1 year. Add 20% for QA/QC. Assume full analyte list (see above) at \$900/sample, plus \$100/sample for data packages, shipping, and expendibles - \$1,000/sample.	6	24	wells/yr	1000	145,833								
	<b>Production A: Sem-Annual</b> sampling from each perimeter + interior well during production. Add 20% for QA/QC. Assume 50% of full analyte list = \$500/sample.	2	24	wells/yr	500	24,306								\$/yr-production
	<b>Production B:</b> Bi-weekly sampling from all perimeter + interior wells, plus 20% for QA/QC. Analytes are parameters that can be tested in CPP lab, so only cost is for expendible supplies - say \$10/sample.	26	24	wells/yr	10	6,319								\$/yr-production
	<b>Period between end of production and start of restoration:</b> Assume same as Production A and Production B.					30,625								\$/yr-transition
	<b>Restoration A:</b> Same and Production A.	2	24	wells/yr	500	24,306								\$/yr-restoration
	<b>Restoration B:</b> At end of restoration, production, perimeter, and interior wells, plus 20% for QA/QC, are sampled for full analyte list.	1	134	wells	1000	133,681								\$/MM#
	<b>Stability A:</b> Same as Restoration A for one year.	2	24	wells/yr	1000	48,611								\$/yr-stability
	<b>Stability B:</b> Same as Restoration B following Stability monitoring.	1	134	wells	1000	133,681								\$/MM#
	<b>Compliance: Assume</b> annual sampling from all compliance wells in mined areas until closure is certified. Use 6 wells per 1M# recovered. Assume analytical cost is \$800/sample.	1	6	wells/yr/M#	800	4,800								\$/yr-cumulative
<b>Radon</b>	CPP (10 dose buttons quarterly)	4	10	buttons/qtr	50	2,000								\$/year
	Satell/Well Field (5 dose buttons/quarter)	4	5	buttons/qtr	50	1,000								\$/year
	Restor/Decom (5 buttons quarterly)	4	5	buttons/qtr	50	1,000								\$/year
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
	Restoration/Stability													
	Restoration A				24,306									
	Restoration B				133,681									
	Stability A					48,611								
	Stability B					133,681								
	Radon					1,000								
	<b>TOTAL</b>				157,986	183,292		-	-	-	-	-	-	-

Site Demolition  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation

Description	cf, gals, dimensions	No./Size	Quantity	Units	Unit Cost	Estimated Demo Cost	Volume (cf) to Load on Trucks	Notes:
<b>Misc Upfront Demo Costs</b>								
Mobilization/demobilization for project demo			1	LS	25,000	25,000		
			<b>Subtotal Misc Upfront Demo:</b>			<b>25,000</b>	<b>0</b>	
						Mob/Site Prep	<b>25,000</b>	
<b>Materials to Demo and Send to 11e(2) Disposal Site</b>								
CPP Pond (liner and leak detection system)								
80 mil HDPE primary liner			166,295	sq ft	0.05	8,300	6,396	
Radium Settling Ponds (liner and leak detection system)								
80 mil HDPE primary liner			2,772,480	sq ft	0.05	138,600	106,634	
			<b>Subtotal Materials to Demo and Send to Rad Waste Disposal Site:</b>			<b>146,900</b>	<b>113,000</b>	cu ft
			<b>Subtotal - Volume of Material to be Disposed in Rad Waste Landfill:</b>				<b>113,000</b>	cu ft
<b>Transportation/Disposal of 11e(2) Waste</b>								
Load 30 cy rolloffs at site w/ FE loader			4,185	cy	2	8,400		
30 cy rolloff haul (710 mi one-way to Andrews, TX)			140	30 cy	3,891	542,800		
Disposal at Waste Control Specialists Andrews, TX			113,000	cf	7	791,000		
			<b>Subtotal Transportation/Disposal Rad Waste:</b>			<b>1,342,200</b>		
						By-Product Disposal	<b>1,489,000</b>	
<b>Equipment/Materials to be Sold or Recycled (demolition and transport to recycling facility)</b>								
Pad or pole-mounted transformers (one per Header Hse) - 10 per truckload		5	1	LS	500	300		
Haul transformers to Rapid City (100 mi one-way)		1	200	mile	3.50	400		
Wire in OHE lines - 47,000' of OHE at Dewey; 54,000' at Burdock - 4 wires			404,000	lf	0	0		
Valve vaults: cut off lid and dispose of lid	200	5	0.5	hrs	50	125		
Valve vaults: truck haul to recycler			200	mile	3.50	700		
Chain-link fencing								
Around CPP site			2,240	lf	3.43	7,700		
Around Satellite site			1,440	lf	3.43	4,900		
Around CPP pond (380' sq)		440' per side	1,760	lf	3.43	6,000		
Around radium settling ponds; CPP			9,700	lf	3.43	33,300		
Around radium settling ponds; Satellite			8,200	lf	3.43	28,100		
Barbed wire fencing in wellfields - 3 strand			87,000	lf	1.75	152,300		
Support steel in Drying area	4,500	1	1	LS	5,000	5,000	4,500	
Equipment at DDW		0	0	LS	1,000	0	0	
			<b>Subtotal Demolition and Transportation/Disposal Equip/Mat'ls to be Sold or Recycled</b>			<b>239,000</b>		
						Equipment sold/recycled	<b>239,000</b>	







## **Deep Disposal Well**

**Summary  
 Closure Cost Estimate  
 Dewey Burdock ISL Mine  
 Powertech Uranium Corporation**

<b>No.</b>	<b>Cost Item</b>	<b>Cost</b>
1	Water Treatment Equipment	-
2	Groundwater Restoration Cost	1,877,000
3	Well Closure	490,000
4	Decommissioning Labor	706,000
5	Mobilization and Site Preparation	25,000
6	Demolition and Disposal of 11e(2)	702,000
7	Plant Equipment Transferred	239,000
8	Demolition with Disposal in Landfill	1,228,000
9	Other Reclamation	915,000
10	Contingency at 15%	927,000
	<b>Total Restoration and Reclamation Cost</b>	<b>7,109,000</b>

**Closure Costs by Year**  
**Dewey Burdock ISL Mine**  
**Powertech Uranium Corporation**

	2010	2011	2012	2013	2014	2015	2016	Total
<b>Production (lbs U3O8)</b>		1,000,000	8,411	-	-	-	-	
Restoration Flow - Dewey (gpm)			250					
Restoration Flow - Burdock (gpm)			250					
<b>Capital Cost</b>								
Restoration Equipment	-	-						-
								-
<b>Operations</b>								
Labor	-	81,000	811,000	189,000	81,000			1,162,000
Electricity			111,000					111,000
Chemicals	-	-	8,500	-	-	-	-	9,000
Maintenance			249,681					250,000
Byproduct Disposal			4,206					4,000
Monitoring	-	-	157,986	183,292				341,000
								<b>1,877,000</b>
<b>Decommissioning</b>								
Well Closure					-	245,000	245,000	490,000
Labor					-	353,000	353,000	706,000
Mob/Site Preparation						25,000		25,000
Demo and Disposal - 11 e(2)						351,000	351,000	702,000
Equipment Transferred						119,500	119,500	239,000
Demo and Disposal - Landfill						614,000	614,000	1,228,000
Other Reclamation						457,500	457,500	915,000
								<b>4,305,000</b>
<b>Contingency</b>								
Contingency at 15%	-	12,150	201,356	55,844	12,150	324,750	321,000	927,000
								<b>927,000</b>
<b>Total Costs</b>	-	<b>93,150</b>	<b>1,543,729</b>	<b>428,135</b>	<b>93,150</b>	<b>2,489,750</b>	<b>2,461,000</b>	<b>7,109,000</b>

**Restoration Equipment  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Description	Equipment List Number	No./Size	Quantity	Units	Unit Cost	Purchase Cost	Shipping Cost	Estimated Capital Cost
Restoration System								
Restoration IX Vessel (118,600 ea + 15k distributor + 8k delivery)	300-IX-001A, B		2	each	0	0	0	0
IX resin - Dowex 21K XLT	NA	2	500	cu ft	0	0	0	0
PC Booster Pump (250 gpm; 90' TDH)	300-P-001 A, B, C		2	each	0	0	0	0
IC Booster Pump	300-P-002 A, B, C		2	each	0	0	0	0
RO Sump Pump	300-P-011, spare		1	each	0	0	0	0
RO Skid (Incl pretmt, filtration and feed pump) 500 gpm	300-RO-001		1	each	0	0	0	0
	<b>Estimated Restoration Equipment - Subtotal:</b>							<b>0</b>

**Restoration Labor  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Labor		2009	2010	2011	2012	2013	2014	2015	2016
<b>Geology</b>									
	Senior Project Geologist	1	1	1					
	Project Geologists	2	4	4					
	Drafting Technicians	1	3	3					
	<b>Subtotal</b>								
<b>Construction/Drilling</b>									
	Construction Superintendent		1	1				0	0
	Drilling Foreman		1	1					
	Drilling Services Leadman		1	1			0	0	0
	Drilling Services Technicians		6	6			0	0	0
	Logging and MIT Technicians		7	7					
	Drilling Supervisor		1	1					
	Wellfield Construction Foreman		1	1					
	General Construction Technicians		8	4		0	0	4	4
	Electrical/Instrumentation		2	2					
	Heavy Equipment		4	2			0	2	2
	Construction Engineer		1	1			0	1	1
	<b>Subtotal</b>								
<b>Production</b>									
	Production Superintendent			1					
	Wellfield Operations Supervisor			1					
	Wellfield Engineer			1					
	Wellfield/Satellite Operations Leadman			1					
	Wellfield/Satellite Operators			12	4	0			
	Restoration Engineer			1	1	1	1		
	Restoration Operator				1	0	0		
	Groundwater Sampling Technician	1	2	2	0	0	0		
	Groundwater Sampling Technician				2	2	0		
	Central Plant Operations Supervisor			1	1	0	0		
	Central Plant Operations Leadman			1					
	Central Plant Operators			4	1	0	0		
	Central Plant Operators - Day			4					
	Dryer Operators			2					
	Chemist/Lab Supervisor			1					
	Lab Technicians			4	1	0	0		
	Maintenance Supervisor			1					
	General Maintenance Techs			4	1	0	0		
	Mechanics			3					
	Electrical/Instrumentation			2	1	0	0		
	<b>Subtotal</b>								
<b>Unit Labor Costs</b>									
<b>Geology</b>				0	0	0	0	0	0
	Senior Project Geologist 135,000	135000	135000	135000	0	0	0	0	0
	Project Geologists 95,000	190000	380000	380000	0	0	0	0	0
	Drafting Technicians 54,000	54000	162000	162000	0	0	0	0	0
	<b>Subtotal</b>			0	0	0	0	0	0
<b>Construction/Drilling</b>				0	0	0	0	0	0
	Construction Superintendent 135,000	0	135000	135000	0	0	0	0	0
	Drilling Foreman 95,000	0	95000	95000	0	0	0	0	0
	Drilling Services Leadman 81,000	0	81000	81000	0	0	0	0	0
	Drilling Services Technicians 54,000	0	324000	324000	0	0	0	0	0
	Logging and MIT Technicians 54,000	0	378000	378000	0	0	0	0	0
	Drilling Supervisor 68,000	0	68000	68000	0	0	0	0	0
	Wellfield Construction Foreman 68,000	0	68000	68000	0	0	0	0	0
	General Construction Technicia 41,000	0	328000	164000	0	0	0	164000	164000
	Electrical/Instrumentation 81,000	0	162000	162000	0	0	0	0	0
	Heavy Equipment 54,000	0	216000	108000	0	0	0	108000	108000
	Construction Engineer 81,000	0	81000	81000	0	0	0	81000	81000
	<b>Subtotal</b>			0	0	0	0	0	0
<b>Production</b>				0	0	0	0	0	0
	Production Superintendent 135,000	0	0	135000	0	0	0	0	0
	Wellfield Operations Supervisor 95,000	0	0	95000	0	0	0	0	0
	Wellfield Engineer 81,000	0	0	81000	0	0	0	0	0
	Wellfield/Satellite Operations Le 68,000	0	0	68000	0	0	0	0	0
	Wellfield/Satellite Operators 54,000	0	0	648000	216000	0	0	0	0
	Restoration Engineer 81,000	0	0	81000	81000	81000	81000	0	0
	Restoration Operator 68,000	0	0	0	68000	0	0	0	0
	Groundwater Sampling Tech 54,000	54000	108000	108000	0	0	0	0	0
	Groundwater Sampling Tech 54,000	0	0	0	108000	108000	0	0	0
	Central Plant Operations Super 122,000	0	0	122000	122000	0	0	0	0
	Central Plant Operations Leadrr 81,000	0	0	81000	0	0	0	0	0
	Central Plant Operators 54,000	0	0	216000	54000	0	0	0	0
	Central Plant Operators - Day 54,000	0	0	216000	0	0	0	0	0
	Dryer Operators 54,000	0	0	108000	0	0	0	0	0
	Chemist/Lab Supervisor 95,000	0	0	95000	0	0	0	0	0
	Lab Technicians 47,000	0	0	188000	47000	0	0	0	0
	Maintenance Supervisor 61,000	0	0	61000	0	0	0	0	0
	General Maintenance Techs 41,000	0	0	164000	41000	0	0	0	0
	Mechanics 61,000	0	0	183000	0	0	0	0	0
	Electrical/Instrumentation 74,000	0	0	148000	74000	0	0	0	0
	<b>Subtotal</b>								

	2009	2010	2011	2012	2013	2014	2015	2016
<b>Restoration and Reclamation Labor Cost</b>			81000	811000	189000	81000	353000	353000

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Description</b>	<b>Quantity</b>	<b>Units</b>
<b>General Operating Assumptions</b>		
1 Production objective	1,000,000	# of U3O8 per year
2 Ave. wellfield design based on # yellowcake per sq ft of ore reserve, equals:	1.60	lb/sq ft
3 ISR recovery efficiency of:	0.75	recovery efficiency
4 First Year production rate	0.91	pounds/yr/sq ft
Average grade of produced water (ppm U3O8)		
5 Area required to meet production objective (online all the time)	911,458	sq ft
	21	acres
6 Area per pattern	10,000	sq ft/pattern
7 Number of online patterns required to meet production objective	91	patterns
8 Number of online Production Wells required to meet production objective	91	production wells
Assuming 20 gpm/production well, total production flow rate equals:	1,823	gpm
Assuming 350 days/yr pumping, average U3O8 grade to meet production objective equals:	130	ppm U3O8
If total flowrate limited to 4,000 gpm, average grade to meet production objective equals:	59	ppm U3O8
9 I/R Ratio	1.6	inj wells/prod wells
10 Number of online Injection Wells required to meet objective	146	injection wells
11 Number of online Production Wells per Header House	18	production wells/HH
12 Number of HH required to meet production objective	5.1	HH
13 Number of Perimeter Monitoring Wells per Header House	2.0	monit wells/HH
14 Number of Internal Monitoring Wells per HH (1 upper +1 lower)	2.0	monit wells/HH
15 Number of Compliance Wells per HH (1300 LF spacing)	0.6	comp wells/HH
16 Subtotal # Monitor wells per HH during production	4.6	total mw/HH
17 Total # Monitoring wells per 1MM # produced during production	23.4	total MW

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
Assumed electricity rate incl demand charge (\$/kwh)	0.07				
<b>Wellfields</b>					
<b>Wells (per well)</b>					
Electric utilities:					
Production well pumps - 20 gpm @ 400 ft TDH	1	20,000	kwh	0.070	1,400
Wellhead heaters (0.5 kw, 180 days/yr)	1	2,000	kwh	0.070	100
<b>Subtotal Power</b>					<b>1,500</b>
<b>Header House (per HH)</b>					
Replacement flow meters (x%/yr)	10	1	ea	50	500
Replacement pressure gauges/switches	20	1	ea	50	1,000
Equip maintenance (@ 10% of new equipment capital)	1	80,000	%	0.10	8,000
<b>Subtotal Maintenance</b>					<b>9,500</b>
Electric utilities:					
Bldg heating (5 kw, 180 days/yr)	1	22,000	kwh	0.070	1,500
Instrumentation (1 kw)	1	9,000	kwh	0.070	600
<b>Subtotal Power</b>					<b>2,100</b>
<b>General well field area</b>					
Pipelines		1	lump sum	50,000	50,000
Road maintenance materials (gravel/culverts)		1	lump sum	10,000	10,000
Wireless telemetry and security systems maintenance		1	lump sum	2,000	2,000
<b>Subtotal Maintenance</b>					<b>62,000</b>
<b>Oxygen/Carbon Dioxide Injection</b>					
Oxygen gas per year		0	tons/yr	1,100	0
Carbon dioxide gas per year		0	tons/yr	1,160	0
<b>Subtotal Chemicals</b>					<b>0</b>
<b>Satellite Plant</b>					
Ion exchange resin replacement - DOWEX 21K XLT		0	cu ft	221	0
Electric utilities:					
PC Booster Pump	2	605,491	kwh	0.070	42,400
IC Booster Pump	2	605,491	kwh	0.070	42,400
Resin Transfer Pump	1	8,830	kwh	0.070	600
Utility Water Pump	1	11,773	kwh	0.070	800
HVAC		105,120	kwh	0.070	7,400
Lighting (0.8 W/ft <sup>2</sup> )	10000	52,560	kwh	0.070	3,700
Instrumentation (2 kw)	1	18,000	kwh	0.070	1,300
<b>Subtotal Power</b>					<b>12,400</b>
Resin Transport to CPP		6	R/T per yr	50	300

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
<b>Land Application</b> (assume 20% to wellfield production)					
Electric utilities 136 days/year (growing season May 11 - Sept 24):					
Land app pumps Dewey (849 gpm at assume 200' TDH)	0	207,509	kwh	0.07	0
Land app pumps Dewey (849 gpm at assume 200' TDH)	0	207,509	kwh	0.07	0
Center pivot hydraulic pump; 10 hp for 25 ac areas (use 8 RHP)	0	137,000	kwh	0.07	0
Center pivot hydraulic pump; 15 hp for 50 ac areas (use 13 RHP)	0	444,000	kwh	0.07	0
Sump pump at 25 ac land app site (return irrigation tailwater/runoff)	0	3,000	kwh	0.07	0
Sump pump at 50 ac land app site (return irrigation tailwater/runoff)	0	10,000	kwh	0.07	0
<b>Subtotal Power</b>					<b>0</b>
<b>Assume 81% to Well Field Restoration</b>					<b>0</b>
Equipment Maintenance:					
Center pivot machines	0	1	year	500	0
Equip Maintenance (@ 3% of new equipment capital) - pumps only		0	%	3	0
Equipment Replacement (@ 3% of new equipment capital)		0	%	3	0
<b>Subtotal Maintenance</b>					<b>0</b>
<b>Assume 81% to Well Field Restoration</b>					<b>0</b>
<b>Water Supply Power @65 gpm</b>					
Groundwater extraction (65 gpm; 400 TDH; 24 hr/day)	1	64,000	kwh	0.070	<b>4,000</b>
<b>Offsite Deep Disposal Well(s) @ 12 gpm</b>					
Trucking to Burns, WY (214 gal/day = 6 trips/year)	2	412	miles/RT	3.50	<b>0</b>
Injection pump maintenance and repair (assume 6% of cap cost)	4	150,000	Cap cost	0.06	<b>9,000</b>
Electric utilities:					
Deep disposal well PD pump (4, but only one operating)					
50 gpm@300 psi = 200 gpm @1000 TDH	4	1,957,400	kwh	0.070	137,000
Bldg heating (1 kw, 180 days/yr)	1	4,000	kwh	0.070	300
<b>Subtotal</b>					<b>137,000</b>
<b>Surge Pond</b>					
Electrical for transfer pumps (120 gpm @ 300" TDH)	1	88,000	kwh	0.07	<b>6,160</b>
Pond Maintenance (\$2,800/pond/yr)	1	1	year	2,800	<b>2,800</b>
<b>Subtotal</b>					<b>8,960</b>
<b>Equipment When Restoration Operations are underway (in addition to production)</b>					
<b>Header Houses</b>					
Equip maintenance (@ 3 % of new equipment capital)		0	%	0.03	0
<b>Sutbotal</b>					<b>0</b>
Electric utilities:					
Bldg heating (5 kw, 180 days/yr)	5.0	108,000	kwh	0.070	7,600
Instrumentation (1 kw)	5.0	44,000	kwh	0.070	3,100
<b>Subtotal</b>					<b>10,700</b>
<b>Restoration</b>					
<b>Restoration Assumptions</b>					
Reclamation consists of 10 PV of activity		10	PVs		
Assume PV = area/1M pounds U3O8 recovered (see operating assumptions above) x 10 ft thick x 20% porosity x 1.5 flare factor x 7.48 gal/cu ft		20,453,125	gallons/M# recovered		
Unit volume required per 1M # recovered per year		1.14			
Volume of flush water required per year		233,165,625	gallons/yr		
Nomical restoration design flow rate (both sites)		500	gpm		
Years to Reclaim 1M pounds of U3O8 recovered		0.89	years		

**Restoration Operating Assumptions  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

	Number	Quantity	Units	Rate	Cost (\$/yr)
<b>Treatment Chemicals</b>					
IX Cost (see KC Restoration Treatment Cost 10_9_08)			LS	1.000	8,500
<b>Subtotal</b>					<b>8,500</b>
<b>Treatment Maintenance</b>					
IX Resin Replacement - assume 4% of cap cost		225,000	cap cost	0.040	9,000
Process hardware maintenance + replmt @ 4% of Capital		994,000	cap cost	0.040	39,760
<b>Subtotal</b>					<b>49,000</b>
<b>Booster Pumps from CPP to Surge Ponds</b>					
Booster Pumps (2 - 250 gpm; 200 TDH; 24 hr/day)	2	245,000	kwh	0.070	17,000
<b>Water Supply Power</b>					
Groundwater extraction (500 gpm; 500 TDH; 24 hr/day)	1	612,000	kwh	0.070	43,000
<b>Well Field Power</b>					
Groundwater extraction (500 gpm; 400 TDH; 24 hr/day)	1	489,000	kwh	0.070	34,000
Treated water reinjection (500 gpm; 200 TDH; 24 hr/day)	1	245,000	kwh	0.070	17,000
<b>Subtotal</b>					<b>51,000</b>
<b>SubTotal Treatment and Power Cost</b>					<b>168,500</b>
<b>Land Application (assume 81% to Restoration)</b>					
- Land Application design 620 gpm of annual flow (restoration = 500 gpm or 81% of design)					
Electric utilities 136 days/year (growing season May 11 - Sept 24):					
Land app pumps Dewey (849 gpm at assume 200' TDH)	0	0	kwh	0.07	0
Land app pumps Dewey (849 gpm at assume 200' TDH)	0	0	kwh	0.07	0
Center pivot hydraulic pump; 10 hp for 25 ac areas (use 8 RHP)	0	0	kwh	0.07	0
Center pivot hydraulic pump; 15 hp for 50 ac areas (use 13 RHP)	0	0	kwh	0.07	0
Sump pump at 25 ac land app site (return irrigation tailwater/runoff)	0	0	kwh	0.07	0
Sump pump at 50 ac land app site (return irrigation tailwater/runoff)	0	0	kwh	0.07	0
<b>Subtotal Power</b>					<b>0</b>
<b>Assume 81% to Well Field Restoration</b>					<b>0</b>
Equipment Maintenance:					
Center pivot machines	0	0	year	500	0
Equip Maintenance (@ 3% of new equipment capital) - pumps only		0	%	3	0
Equipment Replacement (@ 3% of new equipment capital)		0	%	3	0
<b>Subtotal Maintenance</b>					<b>0</b>
<b>Assume 81% to Well Field Restoration</b>					<b>0</b>

**Restoration  
Operation Maintenance  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

		100x100 Grid	Units
Wellfield Maintenance (per MM # produced)			
# Production wells		91	prod wells
# Injection wells		146	inj wells
Well maintenance (assume \$500/well)		119,000	\$/yr
Replacement of submersible pumps (say 10%/yr @ 2,000 each)		18,000	\$/yr
# Header houses (per MM # produced)		5.1	#HH/yr
Header House maintenance	9,500 per HH	48,450	\$/yr
<b>Restoration Assumptions and Cost</b>			
Years to Reclaim wellfields per 1M pounds of U3O8 recovered (see Operating Cost)		0.89	years
Well Field and Treatment Operating Cost			
Treatment Chemicals (see Operating Cost)		8,500	\$/yr
Treatment Maintenance (see Operating Cost)		49,000	\$/yr
Treatment Power (see Operating Cost)		17,000	\$/yr
Water Supply Power (see Operating Cost)		43,000	\$/yr
Water Supply pump replacement (10% of supply pump costs)	75000	7,500	\$/yr
Well Field Power (extraction and injection) (see Operating Cost)		51,000	\$/yr
Well maintenance (\$300/well)	300	71,000	\$/yr
Submersible pump replacement (10% of well field pump costs)		18,000	\$/yr
Well Field Piping Maintenance (assume 50,000/yr)		50,000	\$/yr
Header House			
Replacement meters, gages, and equip (see Operating Cost)	10,700 /HH	54,181	\$/yr
Land Application			
Power Cost (see Operating Cost)		-	\$/yr
Maintenance Cost (see Operating Cost)		0	\$/yr
<b>Restoration Operating Cost</b>		<b>-</b>	<b>\$/yr</b>
<b>Stability Monitoring/Decommissioning</b>			
Equipment Decommissioning (see Decommissioning worksheet)			
Wellfield Decommissioning			
Unit cost per well (assume ave depth of 650 feet)			
5" diameter casing =		0.136	CF/LF
Average well depth =		650	LF
Cubic ft per well =		88.4	CF
Cement grout cost =		9.00	\$/CF
Cement grout cost/well		795.60	\$/well
contractor labor w/ equipment = 4 crew-hr/well @ \$125/hr = \$500.		500	\$/well
Total abandonment cost/well (rounded) =		1,300	\$/well
Monitoring wells	#wells = 140	182,000	\$/LS
Production and Injection wells	#wells = 237	308,100	\$/LS
Piping, power, and HH (see Decommissioning worksheet)		-	\$/LS
<b>Total Wellfield Decommissioning</b>		<b>490,000</b>	<b>\$/LS</b>
<b>Well Decomm Cost per 1M# U</b>		<b>81,667</b>	<b>\$/M# U</b>

**Restoration Treatment Chemicals  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Chemicals:</b>			
Hydrogen peroxide - 50% solution	lb	0.30	\$/lb
Sulfuric acid - 98%	lb	0.135	\$/lb
Sodium hydroxide - 50% solution	lb	0.145	\$/lb
Sodium chloride - all purpose food grade granular	lb	0.09	\$/lb
Sodium carbonate	lb	0.135	\$/lb
Barium chloride - dry powder	lb dihydrate	0.67	\$/lb
Flocculant	gal	1	\$/lb
O2	ton of gas	1,100	\$/ton
CO2	ton of gas	1,160	\$/ton

<b>Restoration Assumptions:</b>			
Flowrate:		500	gpm
Uranium Concentration		5	ppm
Uranium Concentration in IX tails		1	ppm
Annual Production of Restoration Activities		8411	lb U3O8

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cost of Chemicals										
Hydrogen peroxide - 50% solution			900							
Sulfuric acid - 98%			1100							
Sodium hydroxide - 50% solution			1100							
Sodium chloride			3400							
Sodium carbonate			1,000							
Barium chloride - dry powder			1,000							
Flocculant			0							
<b>Subtotal</b>			8,500	-	-	-	-	-	-	-

**ByProduct Disposal During Restoration  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

<b>Byproduct Waste During Operations</b>										
<b>Restoration</b>										
	RO waste and IX waste	Assume costs included in CPP	0						-	
	Well Field waste	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402		
	PPE	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402		
	Decon waste	Assume 1 drum/4 weeks = 2 CF/wk	104	CF/yr	7.00	728	674	1,402		
									-	
										<b>Subtotal</b>
										<b>4,206</b>
* Assume Transport to Andrews, Texas @ 710 miles from Site. Assume \$3.50/loaded mile with 20 CY load, and \$1.85 /unloaded mile. Thus, \$2,485 per 20 CY.										
Therefore, use \$5.35 * 710 = \$3,000 per 20 CY. Decon truck cost = \$500/20 CY										

**Environmental Monitoring  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Ennironmental Monitoring		Number	Quantity	Units	Rate (\$)	Cost (\$/yr)							
<b>Met Station</b>	Assume 1 met station for Site	1	12	visits/yr	200	2400							
<b>Water Qual</b>													
	20 metals, mercury, alk, Cl, SO4, NO3, Fl, EC, pH, and TDS (Test America) @ \$350 (w/shipping)												
	spec, Th, U, and gross A/B (Test America) @ \$550 (w/ shipping)												
	<b>Baseline:</b> Six quarterly samples from each perimerer + interior well + 1 production well per 8 acres for 1 year. Add 20% for QA/QC. Assume full analyte list (see above) at \$900/sample, plus \$100/sample for data packages, shipping, and expendibles - \$1,000/sample.	6	24	wells/yr	1000	145,833	\$/MM#						
	<b>Production A: Sem-Annual</b> sampling from each perimeter + interior well during production. Add 20% for QA/QC. Assume 50% of full analyte list = \$500/sample.	2	24	wells/yr	500	24,306	\$/yr-production						
	<b>Production B:</b> Bi-weekly sampling from all perimeter + interior wells, plus 20% for QA/QC. Analytes are parameters that can be tested in CPP lab, so only cost is for expendible supplies - say \$10/sample.	26	24	wells/yr	10	6,319	\$/yr-production						
	<b>Period between end of production and start of restoration:</b> Assume same as Production A and Production B.					30,625	\$/yr-transition						
	<b>Restoration A:</b> Same and Production A.	2	24	wells/yr	500	24,306	\$/yr-restoration						
	<b>Restoration B:</b> At end of restoration, production, perimeter, and interior wells, plus 20% for QA/QC, are sampled for full analyte list.	1	134	wells	1000	133,681	\$/MM#						
	<b>Stability A:</b> Same as Restoration A for one year.	2	24	wells/yr	1000	48,611	\$/yr-stability						
	<b>Stability B:</b> Same as Restoration B following Stability monitoring.	1	134	wells	1000	133,681	\$/MM#						
	<b>Compliance: Assume</b> annual sampling from all compliance wells in mined areas until closure is certified. Use 6 wells per 1M# recovered. Assume analytical cost is \$800/sample.	1	6	wells/yr/M#	800	4,800	\$/yr-cumulative						
<b>Radon</b>	CPP (10 dose buttons quarterly)	4	10	buttons/qtr	50	2,000	\$/year						
	Satell/Well Field (5 dose buttons/quarter)	4	5	buttons/qtr	50	1,000	\$/year						
	Restor/Decom (5 buttons quarterly)	4	5	buttons/qtr	50	1,000	\$/year						
		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
	Restoration/Stability												
	Restoration A				24,306								
	Restoration B				133,681								
	Stability A					48,611							
	Stability B					133,681							
	Radon					1,000							
	<b>TOTAL</b>				157,986	183,292	-	-	-	-	-	-	-

**Site Demolition  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Description	cf, gals, dimensions	No./Size	Quantity	Units	Unit Cost	Estimated Demo Cost	Volume (cf) to Load on Trucks	Notes:
<b>Misc Upfront Demo Costs</b>								
Mobilization/demobilization for project demo			1	LS	25,000	25,000		
<b>Subtotal Misc Upfront Demo:</b>						<b>25,000</b>	<b>0</b>	
						Mob/Site Prep	<b>25,000</b>	
<b>Materials to Demo and Send to 11e(2) Disposal Site</b>								
CPP Pond (liner and leak detection system)								
80 mil HDPE primary liner			0	sq ft	0.05	0	0	
Radium Settling Ponds (liner and leak detection system)								
80 mil HDPE primary liner			1,386,240	sq ft	0.05	69,300	53,317	
<b>Subtotal Materials to Demo and Send to Rad Waste Disposal Site:</b>						<b>69,300</b>	<b>53,300</b>	cu ft
<b>Subtotal - Volume of Material to be Disposed in Rad Waste Landfill:</b>							<b>53,300</b>	cu ft
<b>Transportation/Disposal of 11e(2) Waste</b>								
Load 30 cy rollofs at site w/ FE loader			1,974	cy	2	3,900		
30 cy rolloff haul (710 mi one-way to Andrews, TX)	\$3.50/mi x \$710 mi RT+\$1.98/mi x \$1.98		66	30 cy	3,891	256,000		
Disposal at Waste Control Specialists Andrews, TX			53,300	cf	7	373,100		
<b>Subtotal Transportation/Disposal Rad Waste:</b>						<b>633,000</b>		
						By-Product Disposal	<b>702,000</b>	
<b>Equipment/Materials to be Sold or Recycled (demolition and transport to recycling facility)</b>								
Pad or pole-mounted transformers (one per Header Hse) - 10 per truckload		5	1	LS	500	300		
Haul transformers to Rapid City (100 mi one-way)		1	200	mile	3.50	400		
Wire in OHE lines - 47,000' of OHE at Dewey; 54,000' at Burdock - 4 wires			404,000	lf	0	0		
Valve vaults: cut off lid and dispose of lid	200	5	0.5	hrs	50	125		
Valve vaults: truck haul to recycler			200	mile	3.50	700		
Chain-link fencing								
Around CPP site			2,240	lf	3.43	7,700		
Around Satellite site			1,440	lf	3.43	4,900		
Around CPP pond (380' sq)		440' per side	1,760	lf	3.43	6,000		
Around radium settling ponds: CPP			9,700	lf	3.43	33,300		
Around radium settling ponds: Satellite			8,200	lf	3.43	28,100		
Barbed wire fencing in wellfields - 3 strand			87,000	lf	1.75	152,300		
Support steel in Drying area	4,500	1	1	LS	5,000	5,000	4,500	
Equipment at DDW		0	0	LS	1,000	0	0	
<b>Subtotal Demolition and Transportation/Disposal Equip/Mat'ls to be Sold or Recycled</b>						<b>239,000</b>		
						Equipment sold/recycled	<b>239,000</b>	

**Site Demolition  
Dewey Burdock ISL Mine  
Powertech Uranium Corporation**

Description	cf, gals, dimensions	No./Size	Quantity	Units	Cost	Demo Cost	Load on Trucks	Notes:
<b>Equipment to other use (Powertech operation)</b>								
Ion Exchange columns, incl resin: assume 12' dia x 15'H	1,700	12	12	LS	1,000	12,000	20,400	6 Semi-loads
Process Pumps in buildings	16	60	60	LS	200	12,000	960	1
Shaker screens: 10'x7'x5'H	400	2	2	LS	2,000	4,000	800	1
Elution columns: 7' dia x 15'H	600	4	4	LS	1,000	4,000	2,400	2
13 ft diameter tanks x 16'H	2,100	22	22	LS	500	11,000	46,200	11
11 ft diameter tanks x 16'H	1,500	2	2	LS	1,000	2,000	3,000	1
10 ft diameter tanks x 16'H	1,300	1	1	LS	1,000	1,000	1,300	1
RO units	400	4	4	LS	1,000	4,000	1,600	1
Thickeners	10,600	2	2	LS	10,000	20,000	21,200	5
Screw conveyors	100	2	2	LS	1,000	2,000	200	6
Filter Presses	2000	2	2	LS	5,000	10,000	4,000	1
Vacuum Dryers and Appurtenances								
Dryers	1071	2	2	LS	10,000	20,000	2,142	2
Vacuum pump/condensor skids, hot oil boiler skids, cooling tower sys	480	2	2	LS	2,000	4,000	960	1
Chemical storage tanks outside CPP - assume 20,000 gal	2674	3	3	LS	500	1,500	8,021	3
Drum conveying system	2,900	1	1	LS	1,000	1,000	2,900	0.5
Drum washer and drying system	1,200	1	1	LS	1,000	1,000	1,200	0.5
Paint booth	400	1	1	LS	500	500	400	0
Resin transfer truck and trailers (1 truck; 2 trailers)			1	LS	0	0		2
Fire suppression pump system	512	1	1	LS	500	500	512	0.5
Land application center pivot machines	4,000	5	5	LS	1,000	5,000	20,000	5
Standby generator	512	1	1	each	500	500	512	0.5
Diesel fuel tank - above ground, assume 15,000 gal	2005	1	1	each	500	500	2,005	1
Gasoline fuel tank - above ground, assume 15,000 gal	2005	1	1	each	500	500	2,005	1
<b>Subtotal Equipment to Demo and Transport to other Powertech mine site:</b>						<b>117,000</b>	<b>142,718</b>	<b>53</b>
<b>Bldgs/Equipment/Materials to Demo and Dispose at Construction and Demolition Landfill</b>								
Building Structures								
Office bldg	60x90x20+roof		148,500	cu ft	0.15	22,300	18,600	
Maintenance/Warehouse	140x120x20		462,000	cu ft	0.15	69,300	33,800	
Fire suppression tank	240,000 gal		30,968	cu ft	0.15	4,600		
CPP Pond (liner and leak detection system)								
60 mil HDPE secondary liner			0	sq ft	0.05	0	0	
Geonet			0	sq ft	0.05	0	0	
Radium Settling Ponds (liner and leak detection system)								
60 mil HDPE secondary liner			1,386,240	sq ft	0.05	69,300	39,607	
Geonet			1,386,240	sq ft	0.05	69,300	39,607	
Power poles: one every 200' (40'H buried 5' in grnd); pull + cut in 1/2 and place pole and cross arms in roll-off	47+54K' OHE	505	505	each	297	150,000	27,874	
Pumps/wellhead appurtenances/cover from prod/inj wells	64	377	377	LS	200	75,400	24,128	
<b>Subtotal Bldgs/Equipment/Materials to Demo and Dispose in Landfill:</b>						<b>460,200</b>	<b>217,093</b>	

