ADDENDUM 2.7-K

GROUNDWATER QUALITY

COMPARISON TO STANDARDS

Ross ISR Project
Regional Baseline Monitor Wells
SA Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I									
		Standard	12-18SA	14-18SA	21-19SA	34-7SA	34-18SA	42-19SA	SA43-18-1	SA43-18-2	SA43-18-3	SA13-17-1
General												
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	**0.5**	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	**4**	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	**6.5-8.5**	2	2	0	4	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	**500**	1	4	4	4	0	0	3	2	1	0
Major Ions												
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	**250**	0	0	0	0	0	0	0	1	0	0
Sulfate	mg/L	**250**	0	4	0	0	0	0	3	2	0	0
Metals												
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	**0.05**	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	**2**	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	**0.75**	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	**0.005**	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	**1**	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	**0.3**	4	0	2	0	0	0	3	2	3	0
Lead, dissolved	mg/L	**0.015**	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	**0.05**	2	1	4	0	0	0	3	2	2	0
Mercury	mg/L	**0.002**	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	**0.05**	0	0	0	0	0	0	2	2	0	0
Silver, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	**5**	0	0	0	0	0	0	0	0	0	0
Radiological												
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	**5**	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	**15**	0	0	0	0	0	0	3	2	2	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
SA Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class II										
		Standard	12-18SA	14-18SA	21-19SA	34-7SA	34-18SA	42-19SA	SA43-18-1	SA43-18-2	SA43-18-3	SA13-17-1
General												
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	**4.5-9.0**	2	1	0	4	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	**2000**	0	0	0	0	0	0	3	2	0	0
Major Ions												
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	**100**	0	0	0	0	0	0	0	2	0	0
Sulfate	mg/L	**200**	0	4	0	0	0	0	3	2	0	0
Metals												
Aluminum, dissolved	mg/L	**5**	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	**0.75**	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	**0.01**	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	**0.2**	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	**5**	0	0	1	0	0	0	2	2	1	0
Lead, dissolved	mg/L	**5**	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	**0.2**	0	0	1	0	0	0	3	2	1	0
Mercury	mg/L	---	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	**0.2**	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	**0.02**	0	0	0	0	0	0	3	2	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	**2**	0	0	0	0	0	0	0	0	0	0
Radiological												
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	**5**	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	**15**	0	0	0	0	0	0	3	2	2	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
SA Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class III										
		Standard	12-18SA	14-18SA	21-19SA	34-7SA	34-18SA	42-19SA	SA43-18-1	SA43-18-2	SA43-18-3	SA13-17-1
General												
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	**6.5-8.5**	2	2	0	4	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	**100**	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	**5000**	0	0	0	0	0	0	3	1	0	0
Major Ions												
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	**2000**	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	**3000**	0	0	0	0	0	0	3	1	0	0
Metals												
Aluminum, dissolved	mg/L	**5**	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	**0.2**	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	**5**	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	**0.05**	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	**0.05**	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	**0.5**	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	**0.00005**	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	**0.05**	0	0	0	0	0	0	2	2	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	**0.1**	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	**25**	0	0	0	0	0	0	0	0	0	0
Radiological												
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	**5**	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	**15**	0	0	0	0	0	0	3	2	2	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
SA Zone Comparison to EPA MCLs

Parameter	Units	EPA Primary											EPA Secondary										
		MCL	12-18SA	14-18SA	21-19SA	34-7SA	34-18SA	42-19SA	SA43-18-1	SA43-18-2	SA43-18-3	SA13-17-1	MCL	12-18SA	14-18SA	21-19SA	34-7SA	34-18SA	42-19SA	SA43-18-1	SA43-18-2	SA43-18-3	SA13-17-1
General																							
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	0	0	0	0	6.5-8.5	2	2	0	4	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	0	0	0	0	500	1	4	4	4	0	0	3	2	1	0
Major Ions																							
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	0	0	0	0	250	0	0	0	0	0	0	0	1	0	0
Sulfate	mg/L	---	0	0	0	0	0	0	0	0	0	0	250	0	4	0	0	0	0	3	2	0	0
Metals																							
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.01	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0.3	4	0	2	0	0	0	3	2	3	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0.05	2	1	4	0	0	0	3	2	2	0
Mercury	mg/L	0.002	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	2	2	0	0	---	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	0	0	0	0	0	0	3	2	0	0	---	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
Radiological																							
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	0	0	0	3	2	2	0	---	0	0	0	0	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
SM Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I							WDEQ Class II							WDEQ Class III						
		Standard	12-18SM	14-18SM	21-19SM	34-7SM	34-18SM	42-19SM	Standard	12-18SM	14-18SM	21-19SM	34-7SM	34-18SM	42-19SM	Standard	12-18SM	14-18SM	21-19SM	34-7SM	34-18SM	42-19SM
General																						
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	0.5	0	0	1	0	4	4	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	4	4	3	4	4	4	4.5-9.0	0	2	3	1	4	4	6.5-8.5	4	4	3	4	4	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	100	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	4	4	3	4	4	4	2000	0	0	0	0	0	0	5000	0	0	0	0	0	0
Major Ions																						
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	100	0	0	0	0	0	0	2000	0	0	0	0	0	0
Sulfate	mg/L	250	0	0	3	4	4	3	200	4	4	3	4	4	3	3000	0	0	0	0	0	0
Metals																						
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.05	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0.75	0	0	0	0	0	0	5	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0.5	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	0.3	0	0	0	1	0	1	5	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	5	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Manganese, total	mg/L	0.05	0	0	0	0	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0	0.00005	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	2	0	0	0	0	0	0	25	0	0	0	0	0	0
Radiological																						
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	0	0	0	15	0	0	0	0	0	0	15	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
SM Zone Comparison to EPA MCLs

Parameter	Units	EPA Primary							EPA Secondary						
		MCL	12-18SM	14-18SM	21-19SM	34-7SM	34-18SM	42-19SM	MCL	12-18SM	14-18SM	21-19SM	34-7SM	34-18SM	42-19SM
General															
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	2	2	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	6.5-8.5	4	4	3	4	4	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	500	4	4	3	4	4	4
Major Ions															
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	250	0	0	0	0	0	0
Sulfate	mg/L	---	0	0	0	0	0	0	250	0	0	3	4	4	3
Metals															
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0.05	0	0	0	0	0	2
Arsenic, dissolved	mg/L	0.01	0	1	1	2	2	0	---	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	---	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	1	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0.3	0	0	0	1	0	1
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	---	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	---	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0
Radiological															
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
OZ Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I							WDEQ Class II							WDEQ Class III						
		Standard	12-18OZ	14-18OZ	21-19OZ	34-7OZ	34-18OZ	42-19OZ	Standard	12-18OZ	14-18OZ	21-19OZ	34-7OZ	34-18OZ	42-19OZ	Standard	12-18OZ	14-18OZ	21-19OZ	34-7OZ	34-18OZ	42-19OZ
General																						
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	0.5	1	2	0	1	1	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	4	4	3	3	3	4	4.5-9.0	0	0	0	0	0	0	6.5-8.5	4	4	3	3	3	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	100	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	4	4	4	4	4	4	2000	0	2	0	0	0	0	5000	0	0	0	0	0	0
Major Ions																						
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	100	0	0	0	0	0	0	2000	0	0	0	0	0	0
Sulfate	mg/L	250	4	4	4	4	4	4	200	4	4	4	4	4	4	3000	0	0	0	0	0	0
Metals																						
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.05	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0.75	0	0	0	0	0	0	5	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0.5	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	0.3	0	3	0	0	1	0	5	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	5	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Manganese, total	mg/L	0.05	0	1	0	0	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0	0.00005	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	2	0	0	0	0	0	0	25	0	0	0	0	0	0
Radiological																						
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	3	0	0	0	4	0	5	3	0	0	0	4	0	5	3	0	0	0	4	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	4	4	4	4	4	4	15	4	4	4	4	4	4	15	4	4	4	4	4	4
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
OZ Zone Comparison to EPA MCLs

Parameter	Units	EPA Primary							EPA Secondary						
		MCL	12-18OZ	14-18OZ	21-19OZ	34-7OZ	34-18OZ	42-19OZ	MCL	12-18OZ	14-18OZ	21-19OZ	34-7OZ	34-18OZ	42-19OZ
General															
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	2	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	6.5-8.5	4	4	3	3	3	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	500	4	4	4	4	4	4
Major Ions															
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	250	0	0	0	0	0	0
Sulfate	mg/L	---	0	0	0	0	0	0	250	4	4	4	4	4	4
Metals															
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0.05	0	1	0	0	0	0
Arsenic, dissolved	mg/L	0.01	0	0	0	0	0	0	---	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	---	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	1	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0.3	0	3	0	0	1	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	---	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0.05	0	1	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	---	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	4	4	0	3	4	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0
Radiological															
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	3	0	0	0	4	0	---	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	4	4	4	4	4	4	---	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
DM Zone Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I							WDEQ Class II							WDEQ Class III						
		Standard	12-18DM	14-18DM	21-19DM	34-7DM	34-18DM	42-19DM	Standard	12-18DM	14-18DM	21-19DM	34-7DM	34-18DM	42-19DM	Standard	12-18DM	14-18DM	21-19DM	34-7DM	34-18DM	42-19DM
General																						
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	0.5	4	1	2	4	4	3	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	4	4	4	4	4	4	4.5-9.0	4	3	4	4	4	4	6.5-8.5	4	4	4	4	4	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	100	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	4	4	4	4	4	4	2000	0	0	0	0	0	0	5000	0	0	0	0	0	0
Major Ions																						
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	250	4	4	4	4	3	3	100	4	4	4	4	4	4	2000	0	0	0	0	0	0
Sulfate	mg/L	250	0	0	0	0	0	0	200	0	0	0	0	0	0	3000	0	0	0	0	0	0
Metals																						
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.05	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	2	3	4	1	1	0.75	0	2	3	4	1	1	5	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.05	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0.5	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	0.3	0	3	2	4	1	2	5	0	0	0	1	0	0	---	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	5	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Manganese, total	mg/L	0.05	0	0	0	1	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0	0.00005	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0.2	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0.02	0	0	0	1	0	0	0.05	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	2	0	0	0	0	0	0	25	0	0	0	0	0	0
Radiological																						
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	1	0	1	0	0	15	0	1	0	1	0	0	15	0	1	0	1	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project
Regional Baseline Monitor Wells
DM Zone Comparison to EPA MCLs

Parameter	Units	EPA Primary							EPA Secondary						
		MCL	12-18DM	14-18DM	21-19DM	34-7DM	34-18DM	42-19DM	MCL	12-18DM	14-18DM	21-19DM	34-7DM	34-18DM	42-19DM
General															
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	2	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	6.5-8.5	4	4	4	4	4	4
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	500	4	4	4	4	4	4
Major Ions															
Calcium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	250	4	4	4	4	3	3
Sulfate	mg/L	---	0	0	0	0	0	0	250	0	0	0	0	0	0
Metals															
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0.05	4	1	2	2	1	2
Arsenic, dissolved	mg/L	0.01	0	0	0	1	0	0	---	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	---	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	---	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	---	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	1	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0.3	0	3	2	4	1	2
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	---	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0.05	0	0	0	1	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	---	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	---	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	0	0	0	0	0	0	---	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	5	0	0	0	0	0	0
Radiological															
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	1	0	1	0	0	---	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	---	0	0	0	0	0	0

Ross ISR Project

Stock Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I															
		Standard	CSWELL03	HBWELL01	HBWELL03	HBWELL04	P17177W	P21128P	P22582P	P50113W	P50883W	P61007W	P71108W	P84665W	SBWELL01	SBWELL02	TWWELL03
General																	
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	0.5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	0	0	5	4	4	3	2	4	0	1	4	3	5	1	2
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Major Ions																	
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	250	0	0	5	4	0	0	0	1	0	0	4	0	0	0	0
Metals																	
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	0.3	4	1	5	3	0	2	0	0	1	0	0	1	0	2	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.05	4	0	5	4	0	2	0	3	0	0	3	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiological																	
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	3	3	3	0	4	2	0	4	3	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Stock Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class II														
		Standard	CSWELL03	HBWELL01	HBWELL03	HBWELL04	P17177W	P21128P	P22582P	P50113W	P50883W	P61007W	P71108W	P84665W	SBWELL01	SBWELL02	TWWELL03
General																	
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	4.5-9.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Major Ions																	
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	200	0	0	5	4	0	0	0	3	0	0	4	0	0	0	1
Metals																	
Aluminum, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	5	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.2	3	0	4	0	0	1	0	2	0	0	2	0	0	0	0
Mercury	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.02	0	0	0	0	0	3	0	4	0	0	1	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiological																	
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	3	3	3	0	4	2	0	4	3	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Stock Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class III															
		Standard	CSWELL03	HBWELL01	HBWELL03	HBWELL04	P17177W	P21128P	P22582P	P50113W	P50883W	P61007W	P71108W	P84665W	SBWELL01	SBWELL02	TWWELL03
General																	
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Major Ions																	
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metals																	
Aluminum, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	0.00005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiological																	
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	3	3	3	0	4	2	0	4	3	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Stock Well Comparison to EPA MCLs

Parameter	Units	EPA Primary															
		MCL	CSWELL03	HBWELL01	HBWELL03	HBWELL04	P17177W	P21128P	P22582P	P50113W	P50883W	P61007W	P71108W	P84665W	SBWELL01	SBWELL02	TWWELL03
General																	
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Major Ions																	
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metals																	
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	0	0	0	4	0	3	0	4	0	0	4	3	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiological																	
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	0	0	0	3	3	3	0	4	2	0	4	3	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Parameter	Units	EPA Secondary														
		MCL	CSWELL03	HBWELL01	HBWELL03	HBWELL04	P17177W	P21128P	P22582P	P50113W	P50883W	P61007W	P71108W	P84665W	SBWELL01	SBWELL02	TWWELL03
General																	
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	0	0	5	4	4	3	2	4	0	1	4	3	5	1	2
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Major Ions																	
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	250	0	0	5	4	0	0	0	1	0	0	4	0	0	0	0
Metals																	
Aluminum, dissolved	mg/L	0.05	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	0.3	4	1	5	3	0	2	0	0	1	0	0	1	0	2	0
Lead, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.05	4	0	5	4	0	2	0	3	0	0	3	0	0	0	0
Mercury	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiological																	
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Domestic Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class I												
		Standard	CSWELL01	DWWELL01	HBWELL05	HBWELL06	P144030W	P31770W	P42868W	P61006W	P78287W	TSWELL01	TW01	TW02
General														
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	0.5	0	3	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	6	6	5	1	1	3	1	1	1	1	5	6
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Major Ions														
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	250	5	6	5	0	0	3	0	0	1	0	5	6
Metals														
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	0.3	0	6	5	0	0	1	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.05	0	1	5	1	1	1	0	0	1	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Radiological														
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	2	1	0	0	1	2	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Domestic Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class II												
		Standard	CSWELL01	DWWELL01	HBWELL05	HBWELL06	P144030W	P31770W	P42868W	P61006W	P78287W	TSWELL01	TW01	TW02
General														
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	4.5-9.0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	2000	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Major Ions														
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	100	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	200	6	6	5	0	0	3	0	0	1	0	5	6
Metals														
Aluminum, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	0.75	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.01	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	5	0	1	4	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.02	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0
Radiological														
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	2	1	0	0	1	2	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Domestic Wells Comparison to WDEQ Class of Use

Parameter	Units	WDEQ Class III												
		Standard	CSWELL01	DWWELL01	HBWELL05	HBWELL06	P144030W	P31770W	P42868W	P61006W	P78287W	TSWELL01	TW01	TW02
General														
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	100	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	5000	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Major Ions														
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	2000	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	3000	0	0	0	0	0	0	0	0	0	0	0	0
Metals														
Aluminum, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	0.5	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	0.00005	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	25	0	0	0	0	0	0	0	0	0	0	0	0
Radiological														
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	2	1	0	0	1	2	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Domestic Well Comparison to EPA MCLs

Parameter	Units	EPA Primary												
		MCL	CSWELL01	DWWELL01	HBWELL05	HBWELL06	P144030W	P31770W	P42868W	P61006W	P78287W	TSWELL01	TW01	TW02
General														
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	4	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	---	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Major Ions														
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Metals														
Aluminum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	0.01	0	0	0	0	0	0	1	0	0	0	0	0
Barium, dissolved	mg/L	2	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	0.005	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1.3	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead, dissolved	mg/L	0.015	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Mercury	mg/L	0.002	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	0.03	0	0	0	0	0	1	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radiological														
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	15	2	1	0	0	1	2	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0

Ross ISR Project
Domestic Well Comparison to EPA MCLs

Parameter	Units	EPA Secondary												
		MCL	CSWELL01	DWWELL01	HBWELL05	HBWELL06	P144030W	P31770W	P42868W	P61006W	P78287W	TSWELL01	TW01	TW02
General														
Alkalinity (as CaCO3)	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ammonia	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	mg/L	2	0	0	0	1	0	0	0	0	0	0	0	0
Laboratory conductivity	µmhos/cm	---	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory pH	s.u.	6.5-8.5	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate/Nitrite	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	mg/L	500	6	6	5	1	1	3	1	1	1	1	5	6
Oil and Grease	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons	mg/L		0	0	0	0	0	0	0	0	0	0	0	0
Major Ions														
Calcium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	mg/L	250	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	250	5	6	5	0	0	3	0	0	1	0	5	6
Metals														
Aluminum, dissolved	mg/L	0.05	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Barium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Boron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Chromium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Copper, dissolved	mg/L	1	0	0	0	0	0	0	0	0	0	0	0	0
Iron, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Iron, total	mg/L	0.3	0	6	5	0	0	1	0	0	0	0	0	0
Lead, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Manganese, total	mg/L	0.05	0	1	5	1	1	1	0	0	1	0	0	0
Mercury	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Selenium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Silver, dissolved	mg/L	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Uranium, suspended	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium, dissolved	mg/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, dissolved	mg/L	5	0	0	0	0	0	0	0	0	0	0	0	0
Radiological														
Lead 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Lead 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Polonium 210, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-226, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Ra-228, Dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Radon-222	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, dissolved	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Th-230, suspended	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Alpha	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0
Gross Beta	pCi/L	---	0	0	0	0	0	0	0	0	0	0	0	0

ADDENDUM 2.7-L

QUALITY ASSURANCE REPORT

ON AQUEOUS RESULTS

As part of Strata's data quality objectives, as outlined in the Sampling and Analysis Plan for Baseline Radiological Monitoring of the Ross ISR Project provided to WDEQ/LQD in December 2009 and in presentations to NRC on October 29, 2009 and February 17, 2010, collecting representative data that can be used for decision making was imperative. Four primary factors were utilized to evaluate aqueous data quality:

- Precision
- Accuracy
- Completeness
- Comparability

The following quality assurance/quality control (QA/QC) analysis includes several sites, outside of the baseline sampling area, not included in the permit applications. These sites were sampled as part of Strata's proactive stakeholder outreach efforts and are included in the QA/QC evaluation to demonstrate the quality of data collected throughout the pre-license baseline monitoring project.

<u>Precision</u>

Strata collected surface and groundwater duplicate samples throughout the baseline monitoring project. The duplicate analytical results were used for QA/QC evaluation, primarily precision. Precision refers to the agreement between two or more measurements of the same parameter and is evaluated by calculating the relative percent difference (RPD) between the samples.

Duplicate and RPD statistics are summarized in Table 1. Duplicate samples were collected in approximately 5 percent of all baseline monitoring project samples. As shown in Table 1, all of the constituents had at least one duplicate analysis. The RPD statistics indicate that approximately 15 percent of the duplicates exceeded the objective of 10 percent. The majority (84 percent) of these exceedances were due to

Table 1. Summary of Precision Results

Parameter	Number of Duplicates	Total Number Valid Samples	Percent Duplicates	Number of RPDs > 10%	Percent of RPDs > 10%
Alkalinity (as CaCO3)	11	247	4%	1	9%
Aluminum, dissolved	11	247	4%	0	0%
Ammonia	11	247	4%	5	45%
Arsenic, dissolved	11	241	5%	1	9%
Barium, dissolved	11	241	5%	0	0%
Bicarbonate	11	247	4%	1	9%
Boron, dissolved	11	241	5%	1	9%
Cadmium, dissolved	11	241	5%	0	0%
Calcium	11	247	4%	1	9%
Carbonate	11	247	4%	3	27%
Chloride	11	247	4%	3	27%
Chromium, dissolved	11	241	5%	0	0%
Copper, dissolved	11	241	5%	0	0%
Dissolved oxygen	6	182	3%	0	0%
Fluoride	11	247	4%	1	9%
Gross Alpha	11	248	4%	7	64%
Gross Beta	11	248	4%	9	82%
Iron, dissolved	11	241	5%	3	27%
Iron, total	11	241	5%	4	36%
Laboratory conductivity	11	248	4%	0	0%
Laboratory pH	11	248	4%	0	0%
Laboratory turbidity	4	55	7%	2	50%
Lead 210, dissolved	6	95	6%	2	33%
Lead 210, suspended	6	93	6%	1	17%
Lead, dissolved	11	241	5%	0	0%
Magnesium	11	247	4%	2	18%
Manganese, total	11	241	5%	2	18%
Mercury	11	241	5%	0	0%
Molybdenum, dissolved	11	241	5%	1	9%
Nickel, dissolved	11	241	5%	0	0%
Nitrate/Nitrite	11	241	5%	1	9%
ORP	4	66	6%	0	0%
Polonium 210, dissolved	6	95	6%	0	0%
Polonium 210, suspended	6	93	6%	0	0%
Potassium	11	247	4%	1	9%
Ra-226, dissolved	11	242	5%	5	45%
Ra-226, suspended	6	93	6%	1	17%
Ra-228, Dissolved	11	242	5%	3	27%
Radon-222	4	22	18%	1	25%
Selenium, dissolved	11	247	4%	3	27%
Silver, dissolved	4	103	4%	0	0%
Sodium	11	247	4%	0	0%
Sulfate	11	247	4%	1	9%
Th-230, dissolved	6	91	7%	0	0%
Th-230, suspended	6	89	7%	0	0%
Total Dissolved Solids	11	248	4%	0	0%
Total Dissolved Solids (calc)	11	247	4%	0	0%
Total Suspended Solids	4	64	6%	1	25%
Uranium, dissolved	11	248	4%	2	18%
Uranium, suspended	6	94	6%	2	33%
Vanadium, dissolved	10	242	4%	0	0%
Zinc, dissolved	11	241	5%	1	9%

comparisons of concentrations near the detection limits. RPD statistics for concentrations measured as less than the detection limit were calculated as half of the detection limit. Complete RPD results are included in Appendix 1.

In addition to the duplicate samples, one split sample was collected by Strata during the baseline monitoring program. The split sample was sent to Pace Laboratory for analysis. Results of the RPD statistics for the split sample are included in Appendix 1. A comparison of the results indicated that several of the detection limits used by Pace Laboratory were lower than those reported by IML. The differences in these detection limits impacted the RPD statistics (13 of the 21 RPDs exceed 10 percent due to the differences in detection limits). Several additional RPD exceedances were due to comparisons of concentrations near the detection limits.

Overall, the RPD statistics indicate that the data collected during the baseline monitoring program are valid.

<u>Accuracy</u>

Accuracy refers to the agreement between measured and true values. Several types of evaluative methods were utilized to determine accuracy including linear regression analysis comparing field and analytical results, ion balance analysis and holding time evaluations. Additionally, the contract laboratory completed spikes and laboratory control samples.

Linear regression analysis was completed for field EC and laboratory EC, field turbidity and laboratory turbidity, and measured TDS and calculated TDS. The following summarizes the regression results.

- Field EC versus laboratory EC: $R^2 = 0.93$
- Field turbidity versus laboratory turbidity: $R^2 = 0.98$
- Measured TDS versus calculated TDS: $R^2 = 0.99$

An analysis of the ion balances was completed to ensure the laboratory criteria (SM 1030E) were met. Two measurements did not meet the designated criteria, CSRES07 and HBRES04 during the 3rd quarter 2009. Since the CSRES07 site was not sampled again during the baseline monitoring program the results were compared to other samples and found to be comparable. A total of six quarters of data were collected at the HBRES04 site during the baseline monitoring program. Although concentrations were slightly lower during the 3rd quarter 2009, no significant differences were apparent. Based on the ion balance analysis all data collected was found to be valid.

A review of the holding times found that two constituents exceeded the holding times. In all instances the results were compared to ion balances and other samples. All results with holding time exceedances were within acceptable limits and were included in the baseline monitoring project.

Completeness

Completeness is the percent of valid data collected for the project. Section 3.4 of the ER and Section 2.7 of the TR summarizes the surface and groundwater sampling results throughout the baseline monitoring project. All of the samples collected by Strata were deemed valid.

Comparability

Comparability refers to the degree (qualitatively) that data from a site can be correlated with data from the same site taken at a different point in time. The following monitoring and management techniques were utilized to maintain a high level of comparability throughout the project:

- Strata utilized the same personnel for all baseline surface and groundwater monitoring.
- All radiological and inorganic chemistry analyses were conducted by the same laboratory (IML, Sheridan, WY)
- All samples were obtained using the same equipment and filtering and preservation was completed in the field.
- Sample preservation techniques.

- Equipment cleaning and decontamination techniques.
- Field instrument calibration and standards; frequency of calibration (logs on file).
- All data collected during the baseline monitoring program were imported into a database. The database was used to conduct validation checks of the data.
- Manual static water levels were used to verify data collected by pressure transducers and data logging equipment installed in the regional baseline monitor wells.

<u>References</u>

Standard Methods for the Examination of Water and Wastewater (SM), 2006, SM 1030, Data Quality.

APPENDIX 1

RPD Statistics

Site	Date	Constituent	Units	Sample	Duplicate	RPD
14-18SA	6/5/2010	Alkalinity (as CaCO3)	mg/l	471	469	0%
14-18SA	6/5/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
14-18SA	6/5/2010	Ammonia	mg/l	<0.1	<0.1	0%
14-18SA	6/5/2010	Anion Sum	meq/L	19.01	19.78	4%
14-18SA	6/5/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
14-18SA	6/5/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
14-18SA	6/5/2010	Bicarbonate	mg/l	526	532	1%
14-18SA	6/5/2010	Boron, dissolved	mg/l	0.2	0.2	0%
14-18SA	6/5/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
14-18SA	6/5/2010	Calcium	mg/l	17	18	6%
14-18SA	6/5/2010	Carbonate	mg/l	24	20	18%
14-18SA	6/5/2010	Cation Sum	meq/L	17.57	17.93	2%
14-18SA	6/5/2010	Chloride	mg/l	86	98	13%
14-18SA	6/5/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
14-18SA	6/5/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
14-18SA	6/5/2010	Field Conductivity	umhos/cm	1909	1933	1%
14-18SA	6/5/2010	Field pH	s.u.	8.81	8.71	1%
14-18SA	6/5/2010	Field turbidity	NTUs	0.61	0.48	24%
14-18SA	6/5/2010	Fluoride	mg/l	0.4	0.4	0%
14-18SA	6/5/2010	Gross Alpha	pCi/l	7.4	7.2	3%
14-18SA	6/5/2010	Gross Beta	pCi/l	5.9	10.8	59%
14-18SA	6/5/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
14-18SA	6/5/2010	Iron, total	mg/l	0.14	0.13	7%
14-18SA	6/5/2010	Laboratory conductivity	umhos/cm	1750	1740	1%
14-18SA	6/5/2010	Laboratory pH	s.u.	8.6	8.6	0%
14-18SA	6/5/2010	Lead 210, dissolved	pCi/l	<1	<1	0%
14-18SA	6/5/2010	Lead 210, suspended	pCi/l	<1	<1	0%
14-18SA	6/5/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
14-18SA	6/5/2010	Magnesium	mg/l	9	10	11%
14-18SA	6/5/2010	Manganese, total	mg/l	0.04	0.04	0%
14-18SA	6/5/2010	Mercury	mg/l	<0.001	<0.001	0%
14-18SA	6/5/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
14-18SA	6/5/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
14-18SA	6/5/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
14-18SA	6/5/2010	ORP	millivolts	-103	-103	0%
14-18SA	6/5/2010	Polonium 210, dissolved	pCi/l	<1	<1	0%
14-18SA	6/5/2010	Polonium 210, suspended	pCi/l	<1	<1	0%
14-18SA	6/5/2010	Potassium	mg/l	11	11	0%
14-18SA	6/5/2010	Ra-226, dissolved	pCi/l	0.27	0.29	7%
14-18SA	6/5/2010	Ra-226, suspended	pCi/l	<0.2	<0.2	0%
14-18SA	6/5/2010	Ra-228, Dissolved	pCi/l	<1	1.12	77%
14-18SA	6/5/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
14-18SA	6/5/2010	Sodium	mg/l	361	367	2%
14-18SA	6/5/2010	Sulfate	mg/l	343	367	7%
14-18SA	6/5/2010	Temperature	Deg C	12.4	12.3	1%
14-18SA	6/5/2010	Th-230, dissolved	pCi/l	<0.2	<0.2	0%
14-18SA	6/5/2010	Th-230, suspended	pCi/l	<0.2	<0.2	0%
14-18SA	6/5/2010	Total Anion/Cation Balance	%	3.93	4.92	22%
14-18SA	6/5/2010	Total Dissolved Solids	mg/l	1230	1210	2%
14-18SA	6/5/2010	Total Dissolved Solids (calc)	mg/l	1110	1150	4%
14-18SA	6/5/2010	Uranium, dissolved	mg/l	0.007	0.008	13%
14-18SA	6/5/2010	Uranium, suspended	mg/l	<0.001	<0.001	0%
14-18SA	6/5/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
14-18SA	6/5/2010	Water Level	ft	22.78	22.78	0%
14-18SA	6/5/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
14-18SM	3/29/2010	Alkalinity (as CaCO3)	mg/l	551	549	0%
14-18SM	3/29/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
14-18SM	3/29/2010	Ammonia	mg/l	<0.1	<0.1	0%
14-18SM	3/29/2010	Anion Sum	meq/L	16.03	16.25	1%
14-18SM	3/29/2010	Arsenic, dissolved	mg/l	0.012	0.011	9%
14-18SM	3/29/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
14-18SM	3/29/2010	Bicarbonate	mg/l	526	521	1%
14-18SM	3/29/2010	Boron, dissolved	mg/l	0.4	0.4	0%
14-18SM	3/29/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
14-18SM	3/29/2010	Calcium	mg/l	2	2	0%
14-18SM	3/29/2010	Carbonate	mg/l	72	73	1%
14-18SM	3/29/2010	Cation Sum	meq/L	15.48	15.93	3%
14-18SM	3/29/2010	Chloride	mg/l	4	3	29%
14-18SM	3/29/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	3/29/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	3/29/2010	Dissolved oxygen	mg/l	2.39		
14-18SM	3/29/2010	Dissolved oxygen	%	21.3		
14-18SM	3/29/2010	Field Conductivity	umhos/cm	1569		
14-18SM	3/29/2010	Field pH	s.u.	9.56		
14-18SM	3/29/2010	Field turbidity	pCi/l	2.53		
14-18SM	3/29/2010	Fluoride	mg/l	1.6	1.5	6%
14-18SM	3/29/2010	Gross Alpha	pCi/l	2.8	<2	95%
14-18SM	3/29/2010	Gross Beta	pCi/l	7.2	3.3	74%
14-18SM	3/29/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
14-18SM	3/29/2010	Iron, total	mg/l	0.06	0.09	40%
14-18SM	3/29/2010	Laboratory conductivity	umhos/cm	1480	1480	0%
14-18SM	3/29/2010	Laboratory pH	s.u.	9.2	9.2	0%
14-18SM	3/29/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	3/29/2010	Magnesium	mg/l	<1	<1	0%
14-18SM	3/29/2010	Manganese, total	mg/l	<0.02	<0.02	0%
14-18SM	3/29/2010	Mercury	mg/l	<0.001	<0.001	0%
14-18SM	3/29/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	3/29/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	3/29/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
14-18SM	3/29/2010	Potassium	mg/l	6	6	0%
14-18SM	3/29/2010	Ra-226, dissolved	pCi/l	<0.2	<0.2	0%
14-18SM	3/29/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
14-18SM	3/29/2010	Radon-222	pCi/l	300	368	20%
14-18SM	3/29/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
14-18SM	3/29/2010	Sodium	mg/l	350	361	3%
14-18SM	3/29/2010	Sulfate	mg/l	232	245	5%
14-18SM	3/29/2010	Temperature	Deg C	10.8		
14-18SM	3/29/2010	Total Anion/Cation Balance	%	1.75	1	55%
14-18SM	3/29/2010	Total Dissolved Solids	mg/l	1020	1030	1%
14-18SM	3/29/2010	Total Dissolved Solids (calc)	mg/l	920	950	3%
14-18SM	3/29/2010	Uranium, dissolved	mg/l	<0.001	<0.001	0%
14-18SM	3/29/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	3/24/2010	Water Level	ft	66.87		
14-18SM	3/29/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
14-18SM	7/24/2010	Alkalinity (as CaCO3)	mg/l	581	580	0%
14-18SM	7/24/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
14-18SM	7/24/2010	Ammonia	mg/l	0.1	0.1	0%
14-18SM	7/24/2010	Anion Sum	meq/L	16.71	16.65	0%
14-18SM	7/24/2010	Arsenic, dissolved	mg/l	0.007	0.005	33%
14-18SM	7/24/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
14-18SM	7/24/2010	Bicarbonate	mg/l	603	615	2%
14-18SM	7/24/2010	Boron, dissolved	mg/l	0.5	0.5	0%
14-18SM	7/24/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
14-18SM	7/24/2010	Calcium	mg/l	2	2	0%
14-18SM	7/24/2010	Carbonate	mg/l	52	46	12%
14-18SM	7/24/2010	Cation Sum	meq/L	16.61	16.54	0%
14-18SM	7/24/2010	Chloride	mg/l	2	2	0%
14-18SM	7/24/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	7/24/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	7/24/2010	Dissolved oxygen	mg/l	2.44	2.59	6%
14-18SM	7/24/2010	Dissolved oxygen, pct	%	22.8	24.4	7%
14-18SM	7/24/2010	Field Conductivity	umhos/cm	1611	1604	0%
14-18SM	7/24/2010	Field pH	s.u.	9.31	9.25	1%
14-18SM	7/24/2010	Field turbidity	pCi/l	0.09	0.11	20%
14-18SM	7/24/2010	Fluoride	mg/l	1.6	1.6	0%
14-18SM	7/24/2010	Gross Alpha	pCi/l	<3.5	<3.9	11%
14-18SM	7/24/2010	Gross Beta	pCi/l	<6.8	7.04	70%
14-18SM	7/24/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
14-18SM	7/24/2010	Iron, total	mg/l	<0.05	<0.05	0%
14-18SM	7/24/2010	Laboratory conductivity	umhos/cm	1560	1570	1%
14-18SM	7/24/2010	Laboratory pH	s.u.	8.9	8.9	0%
14-18SM	7/24/2010	Lead 210, dissolved	pCi/l	<1	<1	0%
14-18SM	7/24/2010	Lead 210, suspended	pCi/l	<1	<1	0%
14-18SM	7/24/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	7/24/2010	Magnesium	mg/l	1	1	0%
14-18SM	7/24/2010	Manganese, total	mg/l	<0.02	<0.02	0%
14-18SM	7/24/2010	Mercury	mg/l	<0.001	<0.001	0%
14-18SM	7/24/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	7/24/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
14-18SM	7/24/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
14-18SM	7/24/2010	ORP	millivolts	-200	-59	109%
14-18SM	7/24/2010	Polonium 210, dissolved	pCi/l	<1	<1	0%
14-18SM	7/24/2010	Polonium 210, suspended	pCi/l	<1	<1	0%
14-18SM	7/24/2010	Potassium	mg/l	7	7	0%
14-18SM	7/24/2010	Ra-226, dissolved	pCi/l	<0.2	<0.2	0%
14-18SM	7/24/2010	Ra-226, suspended	pCi/l	<0.2	<0.2	0%
14-18SM	7/24/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
14-18SM	7/24/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
14-18SM	7/24/2010	Silver, dissolved	mg/l	<0.003	<0.003	0%
14-18SM	7/24/2010	Sodium	mg/l	373	372	0%
14-18SM	7/24/2010	Sulfate	mg/l	238	236	1%
14-18SM	7/24/2010	Temperature	Deg C	11.9	11.6	3%
14-18SM	7/24/2010	Th-230, dissolved	pCi/l	<0.2	<0.2	0%
14-18SM	7/24/2010	Th-230, suspended	pCi/l	<0.2	<0.2	0%
14-18SM	7/24/2010	Total Anion/Cation Balance	%	0.3	0.33	10%
14-18SM	7/24/2010	Total Dissolved Solids	mg/l	1010	1000	1%
14-18SM	7/24/2010	Total Dissolved Solids (calc)	mg/l	970	970	0%
14-18SM	7/24/2010	Uranium, dissolved	mg/l	<0.001	<0.001	0%
14-18SM	7/24/2010	Uranium, suspended	mg/l	<0.001	<0.001	0%
14-18SM	7/24/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
14-18SM	7/24/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
34-18DM	3/17/2010	Alkalinity (as CaCO3)	mg/l	498	502	1%
34-18DM	3/17/2010	Aluminum, dissolved	mg/l	0.4	0.4	0%
34-18DM	3/17/2010	Ammonia	mg/l	3.9	3.8	3%
34-18DM	3/17/2010	Anion Sum	meq/L	14.56	14.34	2%
34-18DM	3/17/2010	Arsenic, dissolved	mg/l	0.007	0.007	0%
34-18DM	3/17/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
34-18DM	3/17/2010	Bicarbonate	mg/l	<5	<5	0%
34-18DM	3/17/2010	Boron, dissolved	mg/l	0.3	0.4	29%
34-18DM	3/17/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
34-18DM	3/17/2010	Calcium	mg/l	4	4	0%
34-18DM	3/17/2010	Carbonate	mg/l	128	129	1%
34-18DM	3/17/2010	Cation Sum	meq/L	14.47	14.26	1%
34-18DM	3/17/2010	Chloride	mg/l	139	129	7%
34-18DM	3/17/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
34-18DM	3/17/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
34-18DM	3/17/2010	Dissolved oxygen	%	36		
34-18DM	3/17/2010	Field Conductivity	umhos/cm	3380		
34-18DM	3/17/2010	Field pH	s.u.	12.91		
34-18DM	3/17/2010	Field turbidity	NTUs	23.3		
34-18DM	3/17/2010	Fluoride	pCi/l	1.2	1.2	0%
34-18DM	3/17/2010	Gross Alpha	pCi/l	<2	<2	0%
34-18DM	3/17/2010	Gross Beta	pCi/l	32.6	35.9	10%
34-18DM	3/17/2010	Iron, dissolved	mg/l	0.07	0.08	13%
34-18DM	3/17/2010	Iron, total	mg/l	0.39	0.39	0%
34-18DM	3/17/2010	Laboratory conductivity	umhos/cm	2170	2150	1%
34-18DM	3/17/2010	Laboratory pH	s.u.	11.7	11.7	0%
34-18DM	3/17/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
34-18DM	3/17/2010	Magnesium	mg/l	<1	<1	0%
34-18DM	3/17/2010	Manganese, total	mg/l	<0.02	<0.02	0%
34-18DM	3/17/2010	Mercury	mg/l	<0.001	<0.001	0%
34-18DM	3/17/2010	Molybdenum, dissolved	mg/l	0.05	0.04	22%
34-18DM	3/17/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
34-18DM	3/17/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
34-18DM	3/17/2010	Potassium	mg/l	44	44	0%
34-18DM	3/17/2010	Ra-226, dissolved	pCi/l	<0.2	<0.2	0%
34-18DM	3/17/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
34-18DM	3/17/2010	Radon-222	pCi/l	<29	<30	3%
34-18DM	3/17/2010	Selenium, dissolved	mg/l	0.008	0.009	12%
34-18DM	3/17/2010	Sodium	mg/l	302	298	1%
34-18DM	3/17/2010	Sulfate	mg/l	29	28	4%
34-18DM	3/17/2010	Temperature	%	11.2		
34-18DM	3/17/2010	Total Anion/Cation Balance	mg/l	0.29	0.28	4%
34-18DM	3/17/2010	Total Dissolved Solids	mg/l	870	870	0%
34-18DM	3/17/2010	Total Dissolved Solids (calc)	mg/l	820	800	2%
34-18DM	3/17/2010	Uranium, dissolved	mg/l	<0.001	<0.001	0%
34-18DM	3/17/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
34-18DM	3/10/2010	Water Level	ft	269.85		
34-18DM	3/17/2010	Zinc, dissolved	mg/l	0.09	0.09	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
34-18OZ	5/18/2010	Alkalinity (as CaCO3)	mg/l	485	486	0%
34-18OZ	5/18/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
34-18OZ	5/18/2010	Ammonia	mg/l	0.4	0.3	29%
34-18OZ	5/18/2010	Anion Sum	meq/L	23.91	23.63	1%
34-18OZ	5/18/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
34-18OZ	5/18/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
34-18OZ	5/18/2010	Bicarbonate	mg/l	540	544	1%
34-18OZ	5/18/2010	Boron, dissolved	mg/l	0.4	0.4	0%
34-18OZ	5/18/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
34-18OZ	5/18/2010	Calcium	mg/l	6	6	0%
34-18OZ	5/18/2010	Carbonate	mg/l	26	24	8%
34-18OZ	5/18/2010	Cation Sum	meq/L	21.75	21.49	1%
34-18OZ	5/18/2010	Chloride	mg/l	8	7	13%
34-18OZ	5/18/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
34-18OZ	5/18/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
34-18OZ	5/18/2010	Dissolved oxygen	mg/l	2.47	2.47	0%
34-18OZ	5/18/2010	Dissolved oxygen	%	23.8	23.8	0%
34-18OZ	5/18/2010	Field Conductivity	umhos/cm	1930	1925	0%
34-18OZ	5/18/2010	Field pH	s.u.	9.18	9.2	0%
34-18OZ	5/18/2010	Field turbidity	pCi/l	3.26	2.21	38%
34-18OZ	5/18/2010	Fluoride	mg/l	0.6	0.6	0%
34-18OZ	5/18/2010	Gross Alpha	pCi/l	111.1	94.1	17%
34-18OZ	5/18/2010	Gross Beta	pCi/l	35.2	14.7	82%
34-18OZ	5/18/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
34-18OZ	5/18/2010	Iron, total	mg/l	0.1	0.09	11%
34-18OZ	5/18/2010	Laboratory conductivity	umhos/cm	2220	2220	0%
34-18OZ	5/18/2010	Laboratory pH	s.u.	8.7	8.7	0%
34-18OZ	5/18/2010	Lead 210, dissolved	pCi/l	1.88	1.4	29%
34-18OZ	5/18/2010	Lead 210, suspended	pCi/l	3.88	4.59	17%
34-18OZ	5/18/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
34-18OZ	5/18/2010	Magnesium	mg/l	2	2	0%
34-18OZ	5/18/2010	Manganese, total	mg/l	<0.02	<0.02	0%
34-18OZ	5/18/2010	Mercury	mg/l	<0.001	<0.001	0%
34-18OZ	5/18/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
34-18OZ	5/18/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
34-18OZ	5/18/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
34-18OZ	5/18/2010	ORP	millivolts	102	102	0%
34-18OZ	5/18/2010	Polonium 210, dissolved	pCi/l	4.77	4.89	2%
34-18OZ	5/18/2010	Polonium 210, suspended	pCi/l	13.38	12.73	5%
34-18OZ	5/18/2010	Potassium	mg/l	6	6	0%
34-18OZ	5/18/2010	Ra-226, dissolved	pCi/l	9.06	9.4	4%
34-18OZ	5/18/2010	Ra-226, suspended	pCi/l	0.49	0.39	23%
34-18OZ	5/18/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
34-18OZ	5/18/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
34-18OZ	5/18/2010	Sodium	mg/l	486	480	1%
34-18OZ	5/18/2010	Sulfate	mg/l	670	657	2%
34-18OZ	5/18/2010	Temperature	Deg C	12.7	13	2%
34-18OZ	5/18/2010	Th-230, dissolved	pCi/l	<0.2	<0.2	0%
34-18OZ	5/18/2010	Th-230, suspended	pCi/l	<0.2	<0.2	0%
34-18OZ	5/18/2010	Total Anion/Cation Balance	%	4.72	4.73	0%
34-18OZ	5/18/2010	Total Dissolved Solids	mg/l	1560	1570	1%
34-18OZ	5/18/2010	Total Dissolved Solids (calc)	mg/l	1470	1450	1%
34-18OZ	5/18/2010	Uranium, dissolved	mg/l	0.059	0.059	0%
34-18OZ	5/18/2010	Uranium, suspended	mg/l	0.19	0.102	60%
34-18OZ	5/18/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
34-18OZ	5/18/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
42-19OZ	10/5/2010	Alkalinity (as CaCO3)	mg/l	480	483	1%
42-19OZ	10/5/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
42-19OZ	10/5/2010	Ammonia	mg/l	0.4	0.4	0%
42-19OZ	10/5/2010	Anion Sum	meq/L	22.2	22.39	1%
42-19OZ	10/5/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
42-19OZ	10/5/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
42-19OZ	10/5/2010	Bicarbonate	mg/l	533	533	0%
42-19OZ	10/5/2010	Boron, dissolved	mg/l	0.3	0.3	0%
42-19OZ	10/5/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
42-19OZ	10/5/2010	Calcium	mg/l	7	6	15%
42-19OZ	10/5/2010	Carbonate	mg/l	26	27	4%
42-19OZ	10/5/2010	Cation Sum	meq/L	24.22	23.88	1%
42-19OZ	10/5/2010	Chloride	mg/l	3	3	0%
42-19OZ	10/5/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
42-19OZ	10/5/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
42-19OZ	10/5/2010	Dissolved oxygen	mg/l	2.6	2.6	0%
42-19OZ	10/5/2010	Dissolved oxygen, pct	%	26.2	26.2	0%
42-19OZ	10/5/2010	Field Conductivity	umhos/cm	2410	2410	0%
42-19OZ	10/5/2010	Field pH	s.u.	8.5	8.5	0%
42-19OZ	10/5/2010	Field turbidity	NTUs	0.5	0.5	0%
42-19OZ	10/5/2010	Fluoride	mg/l	0.3	0.3	0%
42-19OZ	10/5/2010	Gross Alpha	pCi/l	19.6	17.4	12%
42-19OZ	10/5/2010	Gross Beta	pCi/l	13.4	11.5	15%
42-19OZ	10/5/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
42-19OZ	10/5/2010	Iron, total	mg/l	<0.05	<0.05	0%
42-19OZ	10/5/2010	Laboratory conductivity	umhos/cm	2130	2140	0%
42-19OZ	10/5/2010	Laboratory pH	s.u.	8.7	8.7	0%
42-19OZ	10/5/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
42-19OZ	10/5/2010	Magnesium	mg/l	3	2	40%
42-19OZ	10/5/2010	Manganese, total	mg/l	<0.02	<0.02	0%
42-19OZ	10/5/2010	Mercury	mg/l	<0.001	<0.001	0%
42-19OZ	10/5/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
42-19OZ	10/5/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
42-19OZ	10/5/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
42-19OZ	10/5/2010	ORP	millivolts	257	257	0%
42-19OZ	10/5/2010	Potassium	mg/l	7	7	0%
42-19OZ	10/5/2010	Ra-226, dissolved	pCi/l	1.4	1.3	7%
42-19OZ	10/5/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
42-19OZ	10/5/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
42-19OZ	10/5/2010	Silver, dissolved	mg/l	<0.003	<0.003	0%
42-19OZ	10/5/2010	Sodium	mg/l	541	533	1%
42-19OZ	10/5/2010	Sulfate	mg/l	600	607	1%
42-19OZ	10/5/2010	Temperature	Deg C	14.4	14.4	0%
42-19OZ	10/5/2010	Total Anion/Cation Balance	%	4.34	3.23	29%
42-19OZ	10/5/2010	Total Dissolved Solids	mg/l	1500	1550	3%
42-19OZ	10/5/2010	Total Dissolved Solids (calc)	mg/l	1450	1450	0%
42-19OZ	10/5/2010	Uranium, dissolved	mg/l	0.009	0.01	11%
42-19OZ	10/5/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
42-19OZ	10/5/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
CSRES01	8/6/2009	Alkalinity (as CaCO3)	mg/l	128	126	2%
CSRES01	8/6/2009	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
CSRES01	8/6/2009	Ammonia	mg/l	<0.1	0.1	67%
CSRES01	8/6/2009	Anion Sum	meq/L	3.8	3.66	4%
CSRES01	8/6/2009	Arsenic, dissolved	mg/l	0.03	0.03	0%
CSRES01	8/6/2009	Barium, dissolved	mg/l	<0.5	<0.5	0%
CSRES01	8/6/2009	Bicarbonate	mg/l	156	153	2%
CSRES01	8/6/2009	Boron, dissolved	mg/l	<0.1	<0.1	0%
CSRES01	8/6/2009	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
CSRES01	8/6/2009	Calcium	mg/l	28	26	7%
CSRES01	8/6/2009	Carbonate	mg/l	<5	<5	0%
CSRES01	8/6/2009	Cation Sum	meq/L	3.89	3.68	6%
CSRES01	8/6/2009	Chloride	mg/l	42	39	7%
CSRES01	8/6/2009	Chromium, dissolved	mg/l	<0.01	<0.01	0%
CSRES01	8/6/2009	Copper, dissolved	mg/l	<0.01	<0.01	0%
CSRES01	8/6/2009	Dissolved oxygen	mg/l	11	11	0%
CSRES01	8/6/2009	Field Conductivity	umhos/cm	382	375	2%
CSRES01	8/6/2009	Field pH	s.u.	8.9	9.3	4%
CSRES01	8/6/2009	Fluoride	mg/l	0.2	0.3	40%
CSRES01	8/6/2009	Gross Alpha	pCi/l	<2	<2	0%
CSRES01	8/6/2009	Gross Beta	pCi/l	23.7	23.5	1%
CSRES01	8/6/2009	Iron, dissolved	mg/l	0.36	0.21	53%
CSRES01	8/6/2009	Iron, total	mg/l	4.57	4.18	9%
CSRES01	8/6/2009	Laboratory conductivity	umhos/cm	436	416	5%
CSRES01	8/6/2009	Laboratory pH	s.u.	7.5	7.6	1%
CSRES01	8/6/2009	Laboratory turbidity	NTUs	75.1	67.6	11%
CSRES01	8/6/2009	Lead, dissolved	mg/l	<0.02	<0.02	0%
CSRES01	8/6/2009	Magnesium	mg/l	9	8	12%
CSRES01	8/6/2009	Manganese, total	mg/l	0.79	0.69	14%
CSRES01	8/6/2009	Mercury	mg/l	<0.001	<0.001	0%
CSRES01	8/6/2009	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
CSRES01	8/6/2009	Nickel, dissolved	mg/l	<0.01	<0.01	0%
CSRES01	8/6/2009	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
CSRES01	8/6/2009	Potassium	mg/l	24	22	9%
CSRES01	8/6/2009	Ra-226, dissolved	pCi/l	<0.2	<0.2	0%
CSRES01	8/6/2009	Ra-228, Dissolved	pCi/l	<1	<1	0%
CSRES01	8/6/2009	Selenium, dissolved	mg/l	<0.005	<0.005	0%
CSRES01	8/6/2009	Sodium	mg/l	27	27	0%
CSRES01	8/6/2009	Sulfate	mg/l	2	2	0%
CSRES01	8/6/2009	Temperature	Deg C	20.1	20.6	2%
CSRES01	8/6/2009	Total Anion/Cation Balance	%	1.18	0.24	132%
CSRES01	8/6/2009	Total Dissolved Solids	mg/l	430	430	0%
CSRES01	8/6/2009	Total Dissolved Solids (calc)	mg/l	210	200	5%
CSRES01	8/6/2009	Total Suspended Solids	mg/l	84	58	37%
CSRES01	8/6/2009	Uranium, dissolved	mg/l	<0.001	<0.001	0%
CSRES01	8/6/2009	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
CSRES01	8/6/2009	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
CSWELL01	8/6/2009	Alkalinity (as CaCO3)	mg/l	792	640	21%
CSWELL01	8/6/2009	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
CSWELL01	8/6/2009	Ammonia	mg/l	<0.1	<0.1	0%
CSWELL01	8/6/2009	Anion Sum	meq/L	30.39	27.55	10%
CSWELL01	8/6/2009	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
CSWELL01	8/6/2009	Barium, dissolved	mg/l	<0.5	<0.5	0%
CSWELL01	8/6/2009	Bicarbonate	mg/l	931	747	22%
CSWELL01	8/6/2009	Boron, dissolved	mg/l	0.4	0.4	0%
CSWELL01	8/6/2009	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
CSWELL01	8/6/2009	Calcium	mg/l	39	36	8%
CSWELL01	8/6/2009	Carbonate	mg/l	18	17	6%
CSWELL01	8/6/2009	Cation Sum	meq/L	29.66	30.32	2%
CSWELL01	8/6/2009	Chloride	mg/l	6	6	0%
CSWELL01	8/6/2009	Chromium, dissolved	mg/l	<0.01	<0.01	0%
CSWELL01	8/6/2009	Copper, dissolved	mg/l	<0.01	<0.01	0%
CSWELL01	8/6/2009	Field Conductivity	umhos/cm	2770	2770	0%
CSWELL01	8/6/2009	Field pH	s.u.	7.94	8.1	2%
CSWELL01	8/6/2009	Fluoride	mg/l	0.4	0.4	0%
CSWELL01	8/6/2009	Gross Alpha	pCi/l	18.3	18.7	2%
CSWELL01	8/6/2009	Gross Beta	pCi/l	11.3	9.2	20%
CSWELL01	8/6/2009	Iron, dissolved	mg/l	<0.05	<0.05	0%
CSWELL01	8/6/2009	Iron, total	mg/l	<0.05	<0.05	0%
CSWELL01	8/6/2009	Laboratory conductivity	umhos/cm	2560	2580	1%
CSWELL01	8/6/2009	Laboratory pH	s.u.	8.3	8.4	1%
CSWELL01	8/6/2009	Lead, dissolved	mg/l	<0.02	<0.02	0%
CSWELL01	8/6/2009	Magnesium	mg/l	30	29	3%
CSWELL01	8/6/2009	Manganese, total	mg/l	0.02	0.02	0%
CSWELL01	8/6/2009	Mercury	mg/l	<0.001	<0.001	0%
CSWELL01	8/6/2009	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
CSWELL01	8/6/2009	Nickel, dissolved	mg/l	<0.01	<0.01	0%
CSWELL01	8/6/2009	Nitrate/Nitrite	mg/l	0.4	0.5	22%
CSWELL01	8/6/2009	Potassium	mg/l	14	12	15%
CSWELL01	8/6/2009	Ra-226, dissolved	pCi/l	0.86	0.68	23%
CSWELL01	8/6/2009	Ra-228, Dissolved	pCi/l	1.66	1.49	11%
CSWELL01	8/6/2009	Selenium, dissolved	mg/l	0.006	0.008	29%
CSWELL01	8/6/2009	Sodium	mg/l	574	595	4%
CSWELL01	8/6/2009	Sulfate	mg/l	688	698	1%
CSWELL01	8/6/2009	Temperature	Deg C	17.3	12.9	29%
CSWELL01	8/6/2009	Total Anion/Cation Balance	%	1.21	4.77	119%
CSWELL01	8/6/2009	Total Dissolved Solids	mg/l	1920	1930	1%
CSWELL01	8/6/2009	Total Dissolved Solids (calc)	mg/l	1830	1760	4%
CSWELL01	8/6/2009	Uranium, dissolved	mg/l	0.014	0.02	35%
CSWELL01	8/6/2009	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
CSWELL01	8/6/2009	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
CSWELL03	5/18/2010	Alkalinity (as CaCO3)	mg/l	318	312	2%
CSWELL03	5/18/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
CSWELL03	5/18/2010	Ammonia	mg/l	0.3	0.1	100%
CSWELL03	5/18/2010	Anion Sum	meq/L	7.05	6.86	3%
CSWELL03	5/18/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
CSWELL03	5/18/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
CSWELL03	5/18/2010	Bicarbonate	mg/l	379	381	1%
CSWELL03	5/18/2010	Boron, dissolved	mg/l	<0.1	<0.1	0%
CSWELL03	5/18/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
CSWELL03	5/18/2010	Calcium	mg/l	35	34	3%
CSWELL03	5/18/2010	Carbonate	mg/l	<5	<5	0%
CSWELL03	5/18/2010	Cation Sum	meq/L	6.78	6.63	2%
CSWELL03	5/18/2010	Chloride	mg/l	3	3	0%
CSWELL03	5/18/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
CSWELL03	5/18/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
CSWELL03	5/18/2010	Dissolved oxygen	%	15	16.3	8%
CSWELL03	5/18/2010	Dissolved oxygen	mg/l	1.64	1.77	8%
CSWELL03	5/18/2010	Field Conductivity	umhos/cm	641	630	2%
CSWELL03	5/18/2010	Field pH	s.u.	8.18	7.92	3%
CSWELL03	5/18/2010	Field turbidity	pCi/l	4.61	4.48	3%
CSWELL03	5/18/2010	Fluoride	mg/l	0.2	0.2	0%
CSWELL03	5/18/2010	Gross Alpha	pCi/l	2.5	<2	86%
CSWELL03	5/18/2010	Gross Beta	pCi/l	7.7	6.8	12%
CSWELL03	5/18/2010	Iron, dissolved	mg/l	0.55	0.49	12%
CSWELL03	5/18/2010	Iron, total	mg/l	1.3	0.85	42%
CSWELL03	5/18/2010	Laboratory conductivity	umhos/cm	543	518	5%
CSWELL03	5/18/2010	Laboratory pH	s.u.	8.4	8.3	1%
CSWELL03	5/18/2010	Lead 210, dissolved	pCi/l	<1	<1	0%
CSWELL03	5/18/2010	Lead 210, suspended	pCi/l	<1	<1	0%
CSWELL03	5/18/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
CSWELL03	5/18/2010	Magnesium	mg/l	18	19	5%
CSWELL03	5/18/2010	Manganese, total	mg/l	0.34	0.15	78%
CSWELL03	5/18/2010	Mercury	mg/l	<0.001	<0.001	0%
CSWELL03	5/18/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
CSWELL03	5/18/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
CSWELL03	5/18/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
CSWELL03	5/18/2010	Polonium 210, dissolved	pCi/l	<1	<1	0%
CSWELL03	5/18/2010	Polonium 210, suspended	pCi/l	<1	<1	0%
CSWELL03	5/18/2010	Potassium	mg/l	9	9	0%
CSWELL03	5/18/2010	Ra-226, dissolved	pCi/l	0.3	0.43	36%
CSWELL03	5/18/2010	Ra-226, suspended	pCi/l	<0.2	<0.2	0%
CSWELL03	5/18/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
CSWELL03	5/18/2010	Selenium, dissolved	mg/l	0.006	<0.005	82%
CSWELL03	5/18/2010	Sodium	mg/l	76	73	4%
CSWELL03	5/18/2010	Sulfate	mg/l	28	25	11%
CSWELL03	5/18/2010	Temperature	Deg C	11.3	10.9	4%
CSWELL03	5/18/2010	Th-230, dissolved	pCi/l	<0.2	<0.2	0%
CSWELL03	5/18/2010	Th-230, suspended	pCi/l	<0.2	<0.2	0%
CSWELL03	5/18/2010	Total Anion/Cation Balance	%	1.97	1.72	14%
CSWELL03	5/18/2010	Total Dissolved Solids	mg/l	390	390	0%
CSWELL03	5/18/2010	Total Dissolved Solids (calc)	mg/l	360	350	3%
CSWELL03	5/18/2010	Uranium, dissolved	mg/l	0.001	0.001	0%
CSWELL03	5/18/2010	Uranium, suspended	mg/l	0.022	0.004	138%
CSWELL03	5/18/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
CSWELL03	5/18/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
P50113W	8/11/2010	Alkalinity (as CaCO3)	mg/l	536	537	0%
P50113W	8/11/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
P50113W	8/11/2010	Ammonia	mg/l	0.5	<0.1	164%
P50113W	8/11/2010	Anion Sum	meq/L	17.03	17.09	0%
P50113W	8/11/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
P50113W	8/11/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
P50113W	8/11/2010	Bicarbonate	mg/l	654	655	0%
P50113W	8/11/2010	Boron, dissolved	mg/l	<0.1	<0.1	0%
P50113W	8/11/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
P50113W	8/11/2010	Calcium	mg/l	97	98	1%
P50113W	8/11/2010	Carbonate	mg/l	<5	<5	0%
P50113W	8/11/2010	Cation Sum	meq/L	16.27	16.41	1%
P50113W	8/11/2010	Chloride	mg/l	36	36	0%
P50113W	8/11/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
P50113W	8/11/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
P50113W	8/11/2010	Dissolved oxygen	mg/l	1.86	1.77	5%
P50113W	8/11/2010	Dissolved oxygen, pct	%	15.4	15	3%
P50113W	8/11/2010	Field Conductivity	umhos/cm	1613	1627	1%
P50113W	8/11/2010	Field pH	s.u.	7.43	7.46	0%
P50113W	8/11/2010	Field turbidity	pCi/l	0.34	0.24	34%
P50113W	8/11/2010	Fluoride	mg/l	0.2	0.2	0%
P50113W	8/11/2010	Gross Alpha	pCi/l	78.6	83.2	6%
P50113W	8/11/2010	Gross Beta	pCi/l	40.1	33.1	19%
P50113W	8/11/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
P50113W	8/11/2010	Iron, total	mg/l	<0.05	<0.05	0%
P50113W	8/11/2010	Laboratory conductivity	umhos/cm	1500	1510	1%
P50113W	8/11/2010	Laboratory pH	s.u.	8.1	8.1	0%
P50113W	8/11/2010	Laboratory turbidity	NTUs	0.2	0.1	67%
P50113W	8/11/2010	Lead 210, dissolved	pCi/l	2.1	<1	123%
P50113W	8/11/2010	Lead 210, suspended	pCi/l	<1	<1	0%
P50113W	8/11/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
P50113W	8/11/2010	Magnesium	mg/l	52	52	0%
P50113W	8/11/2010	Manganese, total	mg/l	0.44	0.45	2%
P50113W	8/11/2010	Mercury	mg/l	<0.001	<0.001	0%
P50113W	8/11/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
P50113W	8/11/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
P50113W	8/11/2010	Nitrate/Nitrite	mg/l	23.9	24.4	2%
P50113W	8/11/2010	Polonium 210, dissolved	pCi/l	<1	<1	0%
P50113W	8/11/2010	Polonium 210, suspended	pCi/l	<1	<1	0%
P50113W	8/11/2010	Potassium	mg/l	6	6	0%
P50113W	8/11/2010	Ra-226, dissolved	pCi/l	0.5	0.4	22%
P50113W	8/11/2010	Ra-226, suspended	pCi/l	<0.2	<0.2	0%
P50113W	8/11/2010	Ra-228, Dissolved	pCi/l	<1	<1	0%
P50113W	8/11/2010	Selenium, dissolved	mg/l	0.05	0.047	6%
P50113W	8/11/2010	Silver, dissolved	mg/l	<0.003	<0.003	0%
P50113W	8/11/2010	Sodium	mg/l	162	162	0%
P50113W	8/11/2010	Sulfate	mg/l	172	172	0%
P50113W	8/11/2010	Temperature	Deg C	8.3	8.2	1%
P50113W	8/11/2010	Th-230, dissolved	pCi/l	<0.2	<0.2	0%
P50113W	8/11/2010	Th-230, suspended	pCi/l	<0.2	<0.2	0%
P50113W	8/11/2010	Total Anion/Cation Balance	%	2.26	2.02	11%
P50113W	8/11/2010	Total Dissolved Solids	mg/l	1060	1060	0%
P50113W	8/11/2010	Total Dissolved Solids (calc)	mg/l	870	870	0%
P50113W	8/11/2010	Total Suspended Solids	mg/l	<5	<5	0%
P50113W	8/11/2010	Uranium, dissolved	mg/l	0.173	0.173	0%
P50113W	8/11/2010	Uranium, suspended	mg/l	<0.001	<0.001	0%
P50113W	8/11/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
P50113W	8/11/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
TSWELL01	10/22/2009	Alkalinity (as CaCO3)	mg/l	587	588	0%
TSWELL01	10/22/2009	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
TSWELL01	10/22/2009	Ammonia	mg/l	<0.1	<0.1	0%
TSWELL01	10/22/2009	Anion Sum	meq/L	14.32	14.48	1%
TSWELL01	10/22/2009	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
TSWELL01	10/22/2009	Barium, dissolved	mg/l	<0.5	<0.5	0%
TSWELL01	10/22/2009	Bicarbonate	mg/l	666	658	1%
TSWELL01	10/22/2009	Boron, dissolved	mg/l	0.3	0.3	0%
TSWELL01	10/22/2009	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
TSWELL01	10/22/2009	Calcium	mg/l	4	4	0%
TSWELL01	10/22/2009	Carbonate	mg/l	24	29	19%
TSWELL01	10/22/2009	Cation Sum	meq/L	15.75	15.8	0%
TSWELL01	10/22/2009	Chloride	mg/l	1	1	0%
TSWELL01	10/22/2009	Chromium, dissolved	mg/l	<0.01	<0.01	0%
TSWELL01	10/22/2009	Copper, dissolved	mg/l	<0.01	<0.01	0%
TSWELL01	10/22/2009	Field Conductivity	umhos/cm	1303		
TSWELL01	10/22/2009	Field pH	s.u.	8.81		
TSWELL01	10/22/2009	Field turbidity	NTUs	2540		
TSWELL01	10/22/2009	Fluoride	mg/l	0.4	0.4	0%
TSWELL01	10/22/2009	Gross Alpha	pCi/l	10.8	7.3	39%
TSWELL01	10/22/2009	Gross Beta	pCi/l	7.3	4.6	45%
TSWELL01	10/22/2009	Iron, dissolved	mg/l	<0.05	<0.05	0%
TSWELL01	10/22/2009	Iron, total	mg/l	0.22	0.06	114%
TSWELL01	10/22/2009	Laboratory conductivity	umhos/cm	1300	1300	0%
TSWELL01	10/22/2009	Laboratory pH	s.u.	8.7	8.7	0%
TSWELL01	10/22/2009	Lead, dissolved	mg/l	<0.02	<0.02	0%
TSWELL01	10/22/2009	Magnesium	mg/l	2	2	0%
TSWELL01	10/22/2009	Manganese, total	mg/l	<0.02	<0.02	0%
TSWELL01	10/22/2009	Mercury	mg/l	<0.001	<0.001	0%
TSWELL01	10/22/2009	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
TSWELL01	10/22/2009	Nickel, dissolved	mg/l	<0.01	<0.01	0%
TSWELL01	10/22/2009	Nitrate/Nitrite	mg/l	0.1	0.1	0%
TSWELL01	10/22/2009	Potassium	mg/l	4	4	0%
TSWELL01	10/22/2009	Ra-226, dissolved	pCi/l	0.46	0.34	30%
TSWELL01	10/22/2009	Ra-228, Dissolved	pCi/l	1.17	<1	80%
TSWELL01	10/22/2009	Selenium, dissolved	mg/l	<0.005	<0.005	0%
TSWELL01	10/22/2009	Sodium	mg/l	353	354	0%
TSWELL01	10/22/2009	Sulfate	mg/l	122	128	5%
TSWELL01	10/22/2009	Temperature	Deg C	10.4		
TSWELL01	10/22/2009	Total Anion/Cation Balance	%	4.74	4.35	9%
TSWELL01	10/22/2009	Total Dissolved Solids	mg/l	910	840	8%
TSWELL01	10/22/2009	Total Dissolved Solids (calc)	mg/l	840	850	1%
TSWELL01	10/22/2009	Uranium, dissolved	mg/l	0.004	0.004	0%
TSWELL01	10/22/2009	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
TSWELL01	10/22/2009	Zinc, dissolved	mg/l	<0.01	<0.01	0%

Site	Date	Constituent	Units	Sample	Duplicate	RPD
TW02	10/5/2010	Alkalinity (as CaCO3)	mg/l	632	630	0%
TW02	10/5/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
TW02	10/5/2010	Ammonia	mg/l	0.3	0.4	29%
TW02	10/5/2010	Anion Sum	meq/L	22.59	22.6	0%
TW02	10/5/2010	Arsenic, dissolved	mg/l	<0.005	<0.005	0%
TW02	10/5/2010	Barium, dissolved	mg/l	<0.5	<0.5	0%
TW02	10/5/2010	Bicarbonate	mg/l	755	749	1%
TW02	10/5/2010	Boron, dissolved	mg/l	0.4	0.4	0%
TW02	10/5/2010	Cadmium, dissolved	mg/l	<0.002	<0.002	0%
TW02	10/5/2010	Calcium	mg/l	24	24	0%
TW02	10/5/2010	Carbonate	mg/l	8	9	12%
TW02	10/5/2010	Cation Sum	meq/L	22.76	22.86	0%
TW02	10/5/2010	Chloride	mg/l	8	9	12%
TW02	10/5/2010	Chromium, dissolved	mg/l	<0.01	<0.01	0%
TW02	10/5/2010	Copper, dissolved	mg/l	<0.01	<0.01	0%
TW02	10/5/2010	Dissolved oxygen	mg/l	1.02	1.02	0%
TW02	10/5/2010	Dissolved oxygen, pct	%	9.3	9.3	0%
TW02	10/5/2010	Field Conductivity	umhos/cm	2760	2760	0%
TW02	10/5/2010	Field pH	s.u.	8.25	8.25	0%
TW02	10/5/2010	Field turbidity	NTUs	2.05	2.05	0%
TW02	10/5/2010	Fluoride	mg/l	0.5	0.5	0%
TW02	10/5/2010	Gross Alpha	pCi/l	3.1	4	25%
TW02	10/5/2010	Gross Beta	pCi/l	9.2	11.5	22%
TW02	10/5/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
TW02	10/5/2010	Iron, total	mg/l	<0.05	<0.05	0%
TW02	10/5/2010	Laboratory conductivity	umhos/cm	2160	2150	0%
TW02	10/5/2010	Laboratory pH	s.u.	8.4	8.4	0%
TW02	10/5/2010	Lead, dissolved	mg/l	<0.02	<0.02	0%
TW02	10/5/2010	Magnesium	mg/l	11	11	0%
TW02	10/5/2010	Manganese, total	mg/l	0.03	0.03	0%
TW02	10/5/2010	Mercury	mg/l	<0.001	<0.001	0%
TW02	10/5/2010	Molybdenum, dissolved	mg/l	<0.02	<0.02	0%
TW02	10/5/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
TW02	10/5/2010	Nitrate/Nitrite	mg/l	<0.1	<0.1	0%
TW02	10/5/2010	Potassium	mg/l	13	13	0%
TW02	10/5/2010	Ra-226, dissolved	pCi/l	1.1	0.5	75%
TW02	10/5/2010	Ra-228, Dissolved	pCi/l	<1	1.6	105%
TW02	10/5/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
TW02	10/5/2010	Silver, dissolved	mg/l	<0.003	<0.003	0%
TW02	10/5/2010	Sodium	mg/l	466	468	0%
TW02	10/5/2010	Sulfate	mg/l	467	468	0%
TW02	10/5/2010	Temperature	Deg C	11.1	11.1	0%
TW02	10/5/2010	Total Anion/Cation Balance	%	0.39	0.56	36%
TW02	10/5/2010	Total Dissolved Solids	mg/l	1490	1450	3%
TW02	10/5/2010	Total Dissolved Solids (calc)	mg/l	1370	1370	0%
TW02	10/5/2010	Uranium, dissolved	mg/l	<0.001	<0.001	0%
TW02	10/5/2010	Vanadium, dissolved	mg/l	<0.02	<0.02	0%
TW02	10/5/2010	Zinc, dissolved	mg/l	0.01	0.02	67%

Site	Date	Constituent	Units	Sample	Split	RPD
34-7OZ	3/30/2010	Alkalinity (as CaCO3)	mg/l	532	518	3%
34-7OZ	3/30/2010	Aluminum, dissolved	mg/l	<0.1	<0.1	0%
34-7OZ	3/30/2010	Ammonia	mg/l	0.4	0.62	43%
34-7OZ	3/30/2010	Anion Sum	meq/L	23.09		
34-7OZ	3/30/2010	Arsenic, dissolved	mg/l	<0.005	0.0018	33%
34-7OZ	3/30/2010	Barium, dissolved	mg/l	<0.5	0.011	183%
34-7OZ	3/30/2010	Bicarbonate	mg/l	590	484	20%
34-7OZ	3/30/2010	Boron, dissolved	mg/l	0.4	0.4	0%
34-7OZ	3/30/2010	Cadmium, dissolved	mg/l	<0.002	<0.0001	181%
34-7OZ	3/30/2010	Calcium	mg/l	4	4.3	7%
34-7OZ	3/30/2010	Carbonate	mg/l	29	33.3	14%
34-7OZ	3/30/2010	Cation Sum	meq/L	23.74		
34-7OZ	3/30/2010	Chloride	mg/l	5	5.4	8%
34-7OZ	3/30/2010	Chromium, dissolved	mg/l	<0.01	<0.001	164%
34-7OZ	3/30/2010	Copper, dissolved	mg/l	<0.01	<0.001	164%
34-7OZ	3/30/2010	Dissolved oxygen	mg/l	4.26		
34-7OZ	3/30/2010	Dissolved oxygen, pct	%	38.6		
34-7OZ	3/30/2010	Field Conductivity	umhos/cm	2980		
34-7OZ	3/30/2010	Field pH	s.u.	9.2		
34-7OZ	3/30/2010	Field turbidity	pCi/l	2.94		
34-7OZ	3/30/2010	Fluoride	mg/l	0.4	0.58	37%
34-7OZ	3/30/2010	Gross Alpha	pCi/l	69.1	55	23%
34-7OZ	3/30/2010	Gross Beta	pCi/l	16.6	7.57	75%
34-7OZ	3/30/2010	Iron, dissolved	mg/l	<0.05	<0.05	0%
34-7OZ	3/30/2010	Iron, total	mg/l	0.09		
34-7OZ	3/30/2010	Laboratory conductivity	umhos/cm	2130	2290	7%
34-7OZ	3/30/2010	Laboratory pH	s.u.	8.7	8.8	1%
34-7OZ	3/30/2010	Lead, dissolved	mg/l	<0.02	0.00011	196%
34-7OZ	3/30/2010	Magnesium	mg/l	2	2.1	5%
34-7OZ	3/30/2010	Manganese, total	mg/l	<0.02	0.016	46%
34-7OZ	3/30/2010	Mercury	mg/l	<0.001	<0.0002	133%
34-7OZ	3/30/2010	Molybdenum, dissolved	mg/l	<0.02	0.011	10%
34-7OZ	3/30/2010	Nickel, dissolved	mg/l	<0.01	<0.01	0%
34-7OZ	3/30/2010	Nitrate/Nitrite	mg/l	<0.1	<0.01	164%
34-7OZ	3/30/2010	Potassium	mg/l	7	6.1	14%
34-7OZ	3/30/2010	Ra-226, dissolved	pCi/l	1.38	0.878	44%
34-7OZ	3/30/2010	Ra-228, Dissolved	pCi/l	<1	0.722	36%
34-7OZ	3/30/2010	Radon-222	pCi/l	5900	5236	12%
34-7OZ	3/30/2010	Selenium, dissolved	mg/l	<0.005	<0.005	0%
34-7OZ	3/30/2010	Sodium	mg/l	533	492	8%
34-7OZ	3/30/2010	Sulfate	mg/l	590	700	17%
34-7OZ	3/30/2010	Temperature	Deg C	10.1		
34-7OZ	3/30/2010	Total Anion/Cation Balance	%	1.38		
34-7OZ	3/30/2010	Total Dissolved Solids	mg/l	1590	1530	4%
34-7OZ	3/30/2010	Total Dissolved Solids (calc)	mg/l	1460		
34-7OZ	3/30/2010	Uranium, dissolved	mg/l	0.041	0.041	0%
34-7OZ	3/30/2010	Vanadium, dissolved	mg/l	<0.02	<0.01	67%
34-7OZ	3/30/2010	Zinc, dissolved	mg/l	<0.01	<0.01	0%

ADDENDUM 2.7-M

SEO PERMITS FOR REGIONAL BASELINE WELLS

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191679 NAME OF WELL/SPRING DM 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,680.61 Easting 713,356.17 (Feet)
Land surface elevation (ft. above mean sea level) 4134.03 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 487 ft.
Depth to static water level 83.9 ft. (below land surface) Casing height 1.44 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.44 ft. to 472 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 472 ft.
Amount of grout used 109 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 472 ft. to 487 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 472 ft. to 487 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 440 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 550 ft.
Depth of completed well 487 ft. Diameter of well 5 inches.
Depth to first water bearing formation 40 ft.
Depth to principal water bearing formation Top 473 ft. to bottom 489 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	550	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191679

Date of Receipt ______

Date of Approval ______ , 20____

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191680 NAME OF WELL/SPRING SA 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY83 EF Northing 1,489,614.77 Easting 713,356.10 (Feet)
Land surface elevation (ft. above mean sea level) 4134.19 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Groundwater Monitor Well

6. CONSTRUCTION Total depth of well/spring 52 ft.
Depth to static water level 21.0 ft. (below land surface) Casing height 1.22 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.5 ft. to 42 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 42 ft.
Amount of grout used 12 Sacks (example: 10 sacks) type II plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 42 ft. to 52 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air Lift & Pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica
Filter pack/gravel installed from 42 ft. to 52 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn Ent.; 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 3-26-2010

9. PUMP INFORMATION Manufacturer No Pump Installed Type ______
Source of power ______ Horsepower ______ Depth of pump setting or intake ______ ft.
Amount of water being pumped ______ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* Sample Only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ____________
Yield ________ gal./min. with ________ ft. drawdown after ________ hours
Yield ________ gal./min. with ________ ft. drawdown after ________ hours

13. LOG OF WELL Total depth drilled 60 ft.
Depth of completed well 52 ft. Diameter of well 5 inches.
Depth to first water bearing formation 39 ft.
Depth to principal water bearing formation Top 39 ft. to bottom 52 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	60	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ____________

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

____________ Signature of Owner or Authorized Agent

____________ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191680

Date of Receipt ____________

Date of Approval ____________ **, 20**____

Date of Priority 10/12/2009

____________ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191681 NAME OF WELL/SPRING SM 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2310 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,647.62 Easting 713,384.92 (Feet)
Land surface elevation (ft. above mean sea level) 4133.80 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 245 ft.
Depth to static water level 55.4 ft. (below land surface) Casing height 1.28 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.28 ft. to 210 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 210 ft.
Amount of grout used 49 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 210 ft. to 245 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 2.5 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 210 ft. to 245 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable generator Horsepower 1/2 Depth of pump setting or intake 170 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 245 ft.
Depth of completed well 245 ft. Diameter of well 5 inches.
Depth to first water bearing formation 41 ft.
Depth to principal water bearing formation Top 209 ft. to bottom 245 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	245	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Signature of Owner or Authorized Agent ______ Date ______, 20___

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191681

Date of Receipt ______ **Date of Approval** ______, **20**___

Date of Priority 10/12/2009

for State Engineer

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191682 NAME OF WELL/SPRING OZ 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82801 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,634.47 Easting 713,293.28 (Feet)
Land surface elevation (ft. above mean sea level) 4134.88 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 378.5 ft.
Depth to static water level 83.5 ft. (below land surface) Casing height 1.87 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from ______ ft. to ______ ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 318.5 ft.
Amount of grout used 74 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 318.5 ft. to 378.5 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 318.5 ft. to 378.5 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16S 20-18
Source of power Portable generator Horsepower 2.0 Depth of pump setting or intake 300 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 380 ft.
Depth of completed well 378.5 ft. Diameter of well 5 inches.
Depth to first water bearing formation 46 ft.
Depth to principal water bearing formation Top 320 ft. to bottom 380 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	380	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent ______ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. **191682**

Date of Receipt ______ **Date of Approval** ______ **, 20**____

Date of Priority **10/12/2009**

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191691 NAME OF WELL/SPRING DM 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82801 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,760.14 Easting 712,451.60 (Feet)
Land surface elevation (ft. above mean sea level) 4186.64 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 620 ft.
Depth to static water level 268.4 ft. (below land surface) Casing height 1.42 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.42 ft. to 600 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from ______ ft. to ______ ft.
Amount of grout used 139 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 600 ft. to 620 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 600 ft. to 620 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake ______ ft.
Amount of water being pumped ______ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191691 Book No. 1383 Page No. 91

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 640 ft.
Depth of completed well 620 ft. Diameter of well 5 inches.
Depth to first water bearing formation 85 ft.
Depth to principal water bearing formation Top 600 ft. to bottom 621 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	640	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20____ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191691

Date of Receipt ______

Date of Approval ______ **, 20** ____

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191690 NAME OF WELL/SPRING OZ 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
[X] Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
[X] Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ____ Lot ____ Block ____
Resurvey Location Tract ____ or Lot ____ Datum ☐ NAD27 ☐ NAD83 ____
Geographic Coordinates: Latitude ____ N Longitude ____ W (degrees, minutes, seconds)
UTM: Zone ____ Northing ____ Easting ____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,921.52 Easting 709,994.39 (Feet)
Land surface elevation (ft. above mean sea level) 4155.29 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map [X] Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 529 ft.
Depth to static water level 156.9 ft. (below land surface) Casing height 1.18 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule [X] New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.18 ft. to 499 ft. Material PVC Certa-Lok Gage SDR-17
____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
c. Cemented/grouted interval, from 0 ft. to 499 ft.
Amount of grout used 116 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole [X] Factory screen PVC V-Wire
Type of perforator used ____
Size of perforations ____ inches by ____ inches
Number of perforations and depths where perforated
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
Open hole from ____ ft. to ____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 499 ft. to 529 ft.
Diameter ____ slot size ____ set from ____ ft. to ____ ft.
e. Well development method Air-Lift and pump How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? [X] Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 499 ft. to 529 ft.
g. Was surface casing used? [X] Yes ☐ No Was it cemented in place? [X] Yes ☐ No
Surface casing installed from 1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable generator Horsepower 2.0 Depth of pump setting or intake 480 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ____ gal./min.* Surface pressure is ____ lb./sq.inch, or ____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191690 Book No. 1383 Page No. 90

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 530 ft.
Depth of completed well 529 ft. Diameter of well 5 inches.
Depth to first water bearing formation 31 ft.
Depth to principal water bearing formation Top 500 ft. to bottom 530 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	530	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______, 20__ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191690

Date of Receipt ______

Date of Approval ______, 20__

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191689 NAME OF WELL/SPRING SM 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
[X] Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER [ ] Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
[X] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ____ Lot ____ Block ____
Resurvey Location Tract ____ or Lot ____ Datum [ ] NAD27 [ ] NAD83 ____
Geographic Coordinates: Latitude ____ N Longitude ____ W (degrees, minutes, seconds)
UTM: Zone ____ Northing ____ Easting ____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,923.77 Easting 710,066.28 (Feet)
Land surface elevation (ft. above mean sea level) 4155.12 Datum [ ] NAVD29 [ ] NAVD88
Source [ ] GPS [ ] Map [X] Survey [ ] Unknown [ ] Other [ ] Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary (type of rig, and fluid used, if any) [ ] Dug [ ] Driven [ ] Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 327 ft.
Depth to static water level 65.7 ft. (below land surface) Casing height 1.25 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule [X] New [ ] Used Joint type [ ] Threaded [ ] Glued [ ] Welded
5" diameter from +1.25 ft. to 282 ft. Material PVC Certa-Lok Gage SDR-17
____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
c. Cemented/grouted interval, from 0 ft. to 282 ft.
Amount of grout used 65 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion [ ] Customized perforations [ ] Open hole [X] Factory screen PVC V-Wire
Type of perforator used ____
Size of perforations ____ inches by ____ inches
Number of perforations and depths where perforated
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
Open hole from ____ ft. to ____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 282 ft. to 327 ft.
Diameter ____ slot size ____ set from ____ ft. to ____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? [X] Yes [ ] No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 282 ft. to 327 ft.
g. Was surface casing used? [X] Yes [ ] No Was it cemented in place? [X] Yes [ ] No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 260 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ____ gal./min.* Surface pressure is ____ lb./sq.inch, or ____ feet of water
The flow is controlled by [ ] Valve [ ] Cap [ ] Plug
Does well leak around casing? [ ] Yes [ ] No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191689 Book No. 1383 Page No. 89

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 330 ft.
Depth of completed well 327 ft. Diameter of well 5 inches.
Depth to first water bearing formation 33 ft.
Depth to principal water bearing formation Top 282 ft. to bottom 327 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	330	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191689

Date of Receipt ______

Date of Approval ______ **, 20**___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191688 NAME OF WELL/SPRING SA 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
   [X] Please check if address has changed from that shown on permit.
   City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER [ ] Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
   [X] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling)
   Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
   Subdivision Name ____ Lot ____ Block ____
   Resurvey Location Tract ____ or Lot ____ Datum [ ] NAD27 [ ] NAD83 ____
   Geographic Coordinates: Latitude ____ N Longitude ____ W (degrees, minutes, seconds)
   UTM: Zone ____ Northing ____ Easting ____ (meters)
   State Plane Coordinates: Zone WY 83 EF Northing 1,484,962.12 Easting 710,028.44 (Feet)
   Land surface elevation (ft. above mean sea level) 4155.82 Datum [ ] NAVD29 [ ] NAVD88
   Source [ ] GPS [ ] Map [X] Survey [ ] Unknown [ ] Other [ ] Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary [ ] Dug [ ] Driven [ ] Other
   (type of rig, and fluid used, if any)
   Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 65 ft.
   Depth to static water level 22.1 ft. (below land surface) Casing height 1.21 ft. above ground
   a. Diameter of borehole (bit size) 8 3/4 inches
   b. Casing schedule [X] New [ ] Used Joint type [ ] Threaded [ ] Glued [ ] Welded
   5" diameter from +1.21 ft. to 35 ft. Material PVC Certa-Lok Gage SDR-17
   ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   c. Cemented/grouted interval, from 0 ft. to 35 ft.
   Amount of grout used 12 Sacks type II Plus Bentonite Powder
   (example: 10 sacks) (example: bentonite pellets)
   d. Type of completion [ ] Customized perforations [ ] Open hole [X] Factory screen PVC V-Wire
   Type of perforator used ____
   Size of perforations ____ inches by ____ inches
   Number of perforations and depths where perforated
   ____ perforations from ____ ft. to ____ ft.
   ____ perforations from ____ ft. to ____ ft.
   Open hole from ____ ft. to ____ ft.
   Well screen details
   Diameter 3 inch slot size 0.010 inch set from 35 ft. to 65 ft.
   Diameter ____ slot size ____ set from ____ ft. to ____ ft.
   e. Well development method Air-Lift How long was well developed? 1.0 Hour
   f. Was a filter/gravel pack installed? [X] Yes [ ] No Size of sand/gravel 10-20 Colorado Silica Sand
   Filter pack/gravel installed from 35 ft. to 65 ft.
   g. Was surface casing used? [X] Yes [ ] No Was it cemented in place? [X] Yes [ ] No
   Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
   Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (Including pump installation) OR SPRING (first used) January 23, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type ____
   Source of power ____ Horsepower ____ Depth of pump setting or intake ____ ft.
   Amount of water being pumped ____ gal./min.* (For springs or flowing wells, see item 10)
   Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
   If well yields artesian flow or if spring, yield is ____ gal./min.* Surface pressure is ____ lb./sq.inch, or ____ feet of water
   The flow is controlled by [ ] Valve [ ] Cap [ ] Plug
   Does well leak around casing? [ ] Yes [ ] No
   *If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191688 Book No. 1383 Page No. 88

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 70 ft.
Depth of completed well 65 ft. Diameter of well 5 inches.
Depth to first water bearing formation 33 ft.
Depth to principal water bearing formation Top 33 ft. to bottom 65 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	70	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ Date , 20___

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191688

Date of Receipt ______

Date of Approval ______ **, 20**___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191687 NAME OF WELL/SPRING DM 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,888.03 Easting 710,034.63 (Feet)
Land surface elevation (ft. above mean sea level) 4155.06 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 585 ft.
Depth to static water level 156.0 ft. (below land surface) Casing height 1.15 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.15 ft. to 570 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 570 ft.
Amount of grout used 132 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 570 ft. to 585 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 570 ft. to 585 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 540 ft.
Amount of water being pumped 2.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 600 ft.
Depth of completed well 585 ft. Diameter of well 5 inches.
Depth to first water bearing formation 31 ft.
Depth to principal water bearing formation Top 569 ft. to bottom 584 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	600	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191687

Date of Receipt ______

Date of Approval ______ **, 20** ___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191683 NAME OF WELL/SPRING DM 12-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ____ Lot ____ Block ____
Resurvey Location Tract ____ or Lot ____ Datum ☐ NAD27 ☐ NAD83 ____
Geographic Coordinates: Latitude ____ N Longitude ____ W (degrees, minutes, seconds)
UTM: Zone ____ Northing ____ Easting ____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,561.25 Easting 709,213.36 (Feet)
Land surface elevation (ft. above mean sea level) 4188.38 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 632 ft.
Depth to static water level 175 ft. (below land surface) Casing height 1.03 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.2 ft. to 612 ft. Material PVC Certa-Lok Gage SDR-17
____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
c. Cemented/grouted interval, from 0 ft. to 612 ft.
Amount of grout used 142 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ____
Size of perforations ____ inches by ____ inches
Number of perforations and depths where perforated
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
Open hole from ____ ft. to ____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 612 ft. to 632 ft.
Diameter ____ slot size ____ set from ____ ft. to ____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 612 ft. to 632 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 9, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 580 ft.
Amount of water being pumped 3-6 gal./min.* (For springs or flowing wells, see item 10) ~5 gpm at start
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ____ gal./min.* Surface pressure is ____ lb./sq.inch, or ____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 640 ft.
Depth of completed well 632 ft. Diameter of well 5 inches.
Depth to first water bearing formation 62 ft.
Depth to principal water bearing formation Top 612 ft. to bottom 632 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	640	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20____ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191683

Date of Receipt ______

Date of Approval ______ **, 20**____

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191684 NAME OF WELL/SPRING SA 12-18

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street

☒ Please check if address has changed from that shown on permit.

City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,493.96 Easting 709,207.06 (Feet)
Land surface elevation (ft. above mean sea level) 4184.96 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 103 ft.
Depth to static water level 49.9 ft. (below land surface) Casing height 1.0 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.0 ft. to 103 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 103 ft.
Amount of grout used 14 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 set from 63 ft. to 103 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 63 ft. to 103 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) December 9, 2009

9. PUMP INFORMATION Manufacturer No pump installed Type ______
Source of power ______ Horsepower ______ Depth of pump setting or intake ______ ft.
Amount of water being pumped ______ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191684 Book No. 1383 Page No. 84

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 115 ft.
Depth of completed well 103 ft. Diameter of well 5 inches.
Depth to first water bearing formation 56 ft.
Depth to principal water bearing formation Top 63 ft. to bottom 103 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	115	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191684

Date of Receipt ______

Date of Approval ______ **, 20**___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191685 NAME OF WELL/SPRING SM 12-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,527.91 Easting 709,246.38 (Feet)
Land surface elevation (ft. above mean sea level) 4186.01 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 352 ft.
Depth to static water level 87.7 ft. (below land surface) Casing height 1.21 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.21 ft. to 342 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 342 ft.
Amount of grout used 79 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 342 ft. to 352 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 1.5 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 342 ft. to 352 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Land
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 11, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable generator Horsepower 1/2 Depth of pump setting or intake 312 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191685 Book No. 1383 Page No. 85

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 370 ft.
Depth of completed well 352 ft. Diameter of well 5 inches.
Depth to first water bearing formation 57 ft.
Depth to principal water bearing formation Top 341 ft. to bottom 352.5 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	370	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ ______, 20___
Signature of Owner or Authorized Agent Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191685

Date of Receipt ______ **Date of Approval** ______, **20**___

Date of Priority 10/12/2009 ______
for State Engineer

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191686 NAME OF WELL/SPRING OZ 12-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
[X] Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER [ ] Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
[X] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum [ ] NAD27 [ ] NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,530.22 Easting 709,175.71 (Feet)
Land surface elevation (ft. above mean sea level) 4186.64 Datum [ ] NAVD29 [ ] NAVD88
Source [ ] GPS [ ] Map [X] Survey [ ] Unknown [ ] Other [ ] Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary [ ] Dug [ ] Driven [ ] Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 584 ft.
Depth to static water level 168.5 ft. (below land surface) Casing height 1.42 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule [X] New [ ] Used Joint type [ ] Threaded [ ] Glued [ ] Welded
5" diameter from +1.42 ft. to 474 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 474 ft.
Amount of grout used 109 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion [ ] Customized perforations [ ] Open hole [X] Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 474 ft. to 584 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? [X] Yes [ ] No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 474 ft. to 584 ft.
g. Was surface casing used? [X] Yes [ ] No Was it cemented in place? [X] Yes [ ] No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 10, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 444 ft.
Amount of water being pumped 20 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by [ ] Valve [ ] Cap [ ] Plug
Does well leak around casing? [ ] Yes [ ] No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191686 Book No. 1383 Page No. 86

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ____
Yield ____ gal./min. with ____ ft. drawdown after ____ hours
Yield ____ gal./min. with ____ ft. drawdown after ____ hours

13. LOG OF WELL Total depth drilled 601 ft.
Depth of completed well 584 ft. Diameter of well 5 inches.
Depth to first water bearing formation 62 ft.
Depth to principal water bearing formation Top 471 ft. to bottom 584 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	601	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

____ Signature of Owner or Authorized Agent

____, 20____ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191686

Date of Receipt ____

Date of Approval ____, **20**____

Date of Priority 10/12/2009

____ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191702 NAME OF WELL/SPRING OZ 42-19

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street

☒ Please check if address has changed from that shown on permit.

City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,259.02 Easting 713,060.86 (Feet)
Land surface elevation (ft. above mean sea level) 4281.24 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 560 ft.
Depth to static water level 298.5 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.38 ft. to 470 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 470 ft.
Amount of grout used 109 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 470 ft. to 560 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☐ Yes ☒ No Size of sand/gravel Under ream
Filter pack/gravel installed from ______ ft. to ______ ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 11, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2 Depth of pump setting or intake 440 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191702 Book No. 1383 Page No. 102

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 570 ft.
Depth of completed well 560 ft. Diameter of well 5 inches.
Depth to first water bearing formation 80 ft.
Depth to principal water bearing formation Top 468 ft. to bottom 562 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	570	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent ______ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191702

Date of Receipt ______ **Date of Approval** ______ **, 20** ____

Date of Priority 10/12/2009 ______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191701 NAME OF WELL/SPRING SM 42-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,260.94 Easting 713,131.72 (Feet)
Land surface elevation (ft. above mean sea level) 4284.95 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 290 ft.
Depth to static water level 154.3 ft. (below land surface) Casing height 1.35 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.35 ft. to 260 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 260 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 260 ft. to 290 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 260 ft. to 290 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 16, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 230 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191701 Book No. 1383 Page No. 101

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 300 ft.
Depth of completed well 290 ft. Diameter of well 5 inches.
Depth to first water bearing formation 92 ft.
Depth to principal water bearing formation Top 263 ft. to bottom 290 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	300	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191701

Date of Receipt ______

Date of Approval ______ , 20___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191700 NAME OF WELL/SPRING SA 42-19

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,294.66 Easting 713,094.83 (Feet)
Land surface elevation (ft. above mean sea level) 4283.48 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 108 ft.
Depth to static water level dry on 3/9/10 ft. (below land surface) Casing height 1.0 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +.95 ft. to 98 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 98 ft.
Amount of grout used 22 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☒ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations 0.010 inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 set from 98 ft. to 108 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 98 ft. to 108 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) January 9, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type ______
Source of power ______ Horsepower ______ Depth of pump setting or intake ______ ft.
Amount of water being pumped ______ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample Only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191700 Book No. 1383 Page No. 100

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 115 ft.
Depth of completed well 108 ft. Diameter of well 5 inches.
Depth to first water bearing formation 96 ft.
Depth to principal water bearing formation Top 96 ft. to bottom 108 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	115	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☐ Unusable

REMARKS Apparent uppermost groundwater at the time of drilling. No water when probed.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191700

Date of Receipt ______

Date of Approval ______ **, 20** ___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191699 NAME OF WELL/SPRING DM 42-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
   ☒ Please check if address has changed from that shown on permit.
   City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
   ☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
   Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
   Subdivision Name ____ Lot ____ Block ____
   Resurvey Location Tract ____ or Lot ____ Datum ☐ NAD27 ☐ NAD83 ____
   Geographic Coordinates: Latitude ____ N Longitude ____ W (degrees, minutes, seconds)
   UTM: Zone ____ Northing ____ Easting ____ (meters)
   State Plane Coordinates: Zone WY 83 EF Northing 1,481,221.38 Easting 713,097.40 (Feet)
   Land surface elevation (ft. above mean sea level) 4283.38 Datum ☐ NAVD29 ☐ NAVD88
   Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
   Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 610 ft.
   Depth to static water level 284.8 ft. (below land surface) Casing height 1.21 ft. above ground
   a. Diameter of borehole (bit size) 8 3/4 inches
   b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
      5" diameter from +1.2 ft. to 600 ft. Material PVC Certa-Lok Gage SDR-17
      ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   c. Cemented/grouted interval, from 0 ft. to 600 ft.
      Amount of grout used 139 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
   d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
      Type of perforator used ____
      Size of perforations ____ inches by ____ inches
      Number of perforations and depths where perforated
      ____ perforations from ____ ft. to ____ ft.
      ____ perforations from ____ ft. to ____ ft.
      Open hole from ____ ft. to ____ ft.
      Well screen details
      Diameter 3 inch slot size 0.010 inch set from 600 ft. to 610 ft.
      Diameter ____ slot size ____ set from ____ ft. to ____ ft.
   e. Well development method Air-Lift How long was well developed? 1 Hour
   f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
      Filter pack/gravel installed from 600 ft. to 610 ft.
   g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
      Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 16, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
   Source of power Portable Generator Horsepower 1.0 Depth of pump setting or intake 570 ft.
   Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
   Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
    If well yields artesian flow or if spring, yield is ____ gal./min.* Surface pressure is ____ lb./sq.inch, or ____ feet of water
    The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
    Does well leak around casing? ☐ Yes ☐ No
    *If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191699 Book No. 1383 Page No. 99

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 620 ft.
Depth of completed well 610 ft. Diameter of well 5 inches.
Depth to first water bearing formation 85 ft.
Depth to principal water bearing formation Top 600 ft. to bottom 610 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	620	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent ______ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191699

Date of Receipt ______ **Date of Approval** ______ **, 20**____

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191698 NAME OF WELL/SPRING OZ 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,294.95 Easting 710,634.93 (Feet)
Land surface elevation (ft. above mean sea level) 4167.16 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 468 ft.
Depth to static water level 215.2 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.38 ft. to 433 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 433 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 433 ft. to 468 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 433 ft. to 468 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 420 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

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SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 468 ft.
Depth of completed well 468 ft. Diameter of well 5 inches.
Depth to first water bearing formation 20 ft.
Depth to principal water bearing formation Top 440 ft. to bottom 460 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	468	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Well completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______________________ Signature of Owner or Authorized Agent

______________________, 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191698

Date of Receipt ______

Date of Approval ______, **20**___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191697 NAME OF WELL/SPRING SM 21-19

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street

☒ Please check if address has changed from that shown on permit.

City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,301.11 Easting 710,706.70 (Feet)
Land surface elevation (ft. above mean sea level) 4169.85 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 315 ft.
Depth to static water level 84.0 ft. (below land surface) Casing height 1.12 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.12 ft. to 260 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 260 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 260 ft. to 315 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 260 ft. to 315 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 240 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191697 Book No. 1383 Page No. 97

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ____
Yield ____ gal./min. with ____ ft. drawdown after ____ hours
Yield ____ gal./min. with ____ ft. drawdown after ____ hours

13. LOG OF WELL Total depth drilled 320 ft.
Depth of completed well 315 ft. Diameter of well 5 inches.
Depth to first water bearing formation 15 ft.
Depth to principal water bearing formation Top 260 ft. to bottom 320 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	320	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

____ Signature of Owner or Authorized Agent

____ Date , 20____

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191697

Date of Receipt ____

Date of Approval ____ **, 20**____

Date of Priority 10/12/2009

____ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191696 NAME OF WELL/SPRING SA 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,337.40 Easting 710,670.26 (Feet)
Land surface elevation (ft. above mean sea level) 4167.66 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 30 ft.
Depth to static water level 9.0 ft. (below land surface) Casing height 1.54 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.54 ft. to 20 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 3.0 ft. to 20.0 ft.
Amount of grout used 5 Sacks (example: 10 sacks) type Bentonite Chips (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 20 ft. to 30 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 20 ft. to 30 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type ______
Source of power ______ Horsepower ______ Depth of pump setting or intake ______ ft.
Amount of water being pumped ______ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191696 Book No. 1383 Page No. 96

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 35 ft.
Depth of completed well 30 ft. Diameter of well 5 inches.
Depth to first water bearing formation 15 ft.
Depth to principal water bearing formation Top 15 ft. to bottom 35 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	35	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191696

Date of Receipt ______

Date of Approval ______ **, 20**___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191695 NAME OF WELL/SPRING DM 21-19

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
[X] Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER [ ] Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
[X] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19 , T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum [ ] NAD27 [ ] NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,261.04 Easting 710,663.72 (Feet)
Land surface elevation (ft. above mean sea level) 4168.84 Datum [ ] NAVD29 [ ] NAVD88
Source [ ] GPS [ ] Map [X] Survey [ ] Unknown [ ] Other [ ] Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary [ ] Dug [ ] Driven [ ] Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 565 ft.
Depth to static water level 195.3 ft. (below land surface) Casing height 1.25 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule [X] New [ ] Used Joint type [ ] Threaded [ ] Glued [ ] Welded
5" diameter from +1.25 ft. to 550 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 550 ft.
Amount of grout used 128 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion [ ] Customized perforations [ ] Open hole [X] Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 550 ft. to 565 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? [X] Yes [ ] No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 550 ft. to 565 ft.
g. Was surface casing used? [X] Yes [ ] No Was it cemented in place? [X] Yes [ ] No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable Generator Horsepower 1.0 Depth of pump setting or intake 520 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by [ ] Valve [ ] Cap [ ] Plug
Does well leak around casing? [ ] Yes [ ] No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191695 Book No. 1383 Page No. 95

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 580 ft.
Depth of completed well 565 ft. Diameter of well 5 inches.
Depth to first water bearing formation 17 ft.
Depth to principal water bearing formation Top 535 ft. to bottom 566 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	580	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent ______ Date , 20__

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191695

Date of Receipt ______ **Date of Approval** ______ **, 20**__

Date of Priority 10/12/2009 ______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191694 NAME OF WELL/SPRING OZ 34-18

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18 , T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,796.90 Easting 712,419.26 (Feet)
Land surface elevation (ft. above mean sea level) 4246.14 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 565 ft.
Depth to static water level 276.8 ft. (below land surface) Casing height 1.51 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.51 ft. to 460 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 460 ft.
Amount of grout used 107 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 460 ft. to 565 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☐ Yes ☒ No Size of sand/gravel N/A
Filter pack/gravel installed from ______ ft. to ______ ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 430 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191694 Book No. 1383 Page No. 94

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 570 ft.
Depth of completed well 565 ft. Diameter of well 5 inches.
Depth to first water bearing formation 86 ft.
Depth to principal water bearing formation Top 456 ft. to bottom 565 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	570	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Ore Zone monitor well.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent ______ Date , 20___

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191694

Date of Receipt ______ **Date of Approval** ______ **, 20** ___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191693 NAME OF WELL/SPRING SM 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☐ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ______ Lot ______ Block ______
Resurvey Location Tract ______ or Lot ______ Datum ☐ NAD27 ☐ NAD83 ______
Geographic Coordinates: Latitude ______ N Longitude ______ W (degrees, minutes, seconds)
UTM: Zone ______ Northing ______ Easting ______ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,792.02 Easting 712,489.64 (Feet)
Land surface elevation (ft. above mean sea level) 4246.86 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 298 ft.
Depth to static water level 135.7 ft. (below land surface) Casing height 1.08 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.08 ft. to 278 ft. Material PVC Certa-Lok Gage SDR-17
______ diameter from ______ ft. to ______ ft. Material ______ Gage ______
c. Cemented/grouted interval, from 0 ft. to 278 ft.
Amount of grout used 64 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used ______
Size of perforations ______ inches by ______ inches
Number of perforations and depths where perforated
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
Open hole from ______ ft. to ______ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 278 ft. to 298 ft.
Diameter ______ slot size ______ set from ______ ft. to ______ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 278 ft. to 298 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 250 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ______ gal./min.* Surface pressure is ______ lb./sq.inch, or ______ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191693 Book No. 1383 Page No. 93

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom ______
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 307 ft.
Depth of completed well 298 ft. Diameter of well 5 inches.
Depth to first water bearing formation 90 ft.
Depth to principal water bearing formation Top 277 ft. to bottom 298 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	307	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS ______

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______ Signature of Owner or Authorized Agent

______ , 20___ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191693

Date of Receipt ______

Date of Approval ______ **, 20** ___

Date of Priority 10/12/2009

______ **for State Engineer**

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191692 NAME OF WELL/SPRING SA 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
[X] Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER [ ] Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
[X] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name ___ Lot ___ Block ___
Resurvey Location Tract ___ or Lot ___ Datum [ ] NAD27 [ ] NAD83 ___
Geographic Coordinates: Latitude ___ N Longitude ___ W (degrees, minutes, seconds)
UTM: Zone ___ Northing ___ Easting ___ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,828.31 Easting 712,453.49 (Feet)
Land surface elevation (ft. above mean sea level) 4246.27 Datum [ ] NAVD29 [ ] NAVD88
Source [ ] GPS [ ] Map [X] Survey [ ] Unknown [ ] Other [ ] Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION [X] Drilled Mud Rotary [ ] Dug [ ] Driven [ ] Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 70 ft.
Depth to static water level Dry 3/10/10 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule [X] New [ ] Used Joint type [ ] Threaded [ ] Glued [ ] Welded
5" diameter from +1.38 ft. to 50 ft. Material PVC Certa-Lok Gage SDR-17
___ diameter from ___ ft. to ___ ft. Material ___ Gage ___
c. Cemented/grouted interval, from 0 ft. to 50 ft.
Amount of grout used 12 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion [ ] Customized perforations [ ] Open hole [X] Factory screen PVC V-Wire
Type of perforator used ___
Size of perforations ___ inches by ___ inches
Number of perforations and depths where perforated
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
Open hole from ___ ft. to ___ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 50 ft. to 70 ft.
Diameter ___ slot size ___ set from ___ ft. to ___ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? [X] Yes [ ] No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 50 ft. to 70 ft.
g. Was surface casing used? [X] Yes [ ] No Was it cemented in place? [X] Yes [ ] No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) January 14, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type ___
Source of power ___ Horsepower ___ Depth of pump setting or intake ___ ft.
Amount of water being pumped ___ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is ___ gal./min.* Surface pressure is ___ lb./sq.inch, or ___ feet of water
The flow is controlled by [ ] Valve [ ] Cap [ ] Plug
Does well leak around casing? [ ] Yes [ ] No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191692 Book No. 1383 Page No. 92

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom
Yield ______ gal./min. with ______ ft. drawdown after ______ hours
Yield ______ gal./min. with ______ ft. drawdown after ______ hours

13. LOG OF WELL Total depth drilled 80 ft.
Depth of completed well 70 ft. Diameter of well 5 inches.
Depth to first water bearing formation 47 ft.
Depth to principal water bearing formation Top 47 ft. to bottom 70 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	80	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☐ Unusable N/A

REMARKS Water apparent at time of drilling. Dry when probed 3/10/10.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

______________________ Signature of Owner or Authorized Agent

______________________ , 20____ Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191692

Date of Receipt ______________________

Date of Approval ______________________ **, 20**____

Date of Priority 10/12/2009

______________________ **for State Engineer**

ADDENDUM 2.9-A

RADIOLOGICAL SAMPLING AND ANALYSIS PLAN

Sampling and Analysis Plan For Baseline Radiological Monitoring Of The Ross ISR Uranium Recovery Project Crook County, Wyoming

Prepared for:

WWC Engineering, Sheridan Wyoming.

Prepared by:

SENES Consultants Limited
Centennial, Colorado

August 6, 2010
Rev 5

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1.0 INTRODUCTION

On behalf of WWC Engineering and Strata Energy, Inc. (a wholly owned US subsidiary of Peninsula Minerals, Ltd), SENES Consultants Limited (SENES), has prepared this Sampling and Analysis Plan (SAP) in support of the design of a baseline radiological monitoring program for Ross ISR uranium recovery project in Crook County, Wyoming. The purpose of this SAP to describe the general approach and methods to be used by all project team members to collect and evaluate the data and information required to establish a radiological environmental baseline for the Ross site. Details of the sampling methods are described in the applicable Standard Operating Procedures (SOPs) attached as appendices to this document.

1.1 SUMMARY OF EXPLORATION ACTIVITIES AND SITE HISTORY

Strata minerals have obtained a permit area for 1,638 acres of land in the Lance Formation of Northeast Wyoming. The permit area acreage can be defined as follows: 1,278 acres of deeded land, 320 acres of State of Wyoming land, and 40 acres of Department of Interior land managed by the Bureau of Land Management. The ore bodies identified in the permit area are estimated to hold at least 4 million pounds of uranium. The area was first explored in early 1970 by a joint venture of Nuclear Dynamics and Bethlehem Steel Corporation, the Nubeth Joint Venture (Nubeth). Surveys north of Moorcroft Wyoming (Lance district) indicated gamma ray anomalies. An aggressive land and mineral acquisition phase followed along with an exploration drilling program covering more than 110,000 acres and 3 million feet of drilling. Nubeth received a WDEQ/LQD License to Explore (No. 19) in August 1976 with modifications to accommodate the research and development activities in 1978. Nubeth filed for a source materials license in November 1977 with approval in April 1978 (SUA-1331). A five spot pattern, consisting of four injection wells with one recovery well was operated from August 1978 to April 1979. Final approval for the research and development (R&D) site decommissioning was granted by the regulatory agencies in 1983.

Three primary water bearing systems were defined for the R&D site: a surficial aquifer, an ‘A zone’ aquifer, and a ‘B zone’ aquifer. The B zone aquifer represents the ore bearing intervals and contains an industrial quality drinking water with quality exceedances of drinking water standards for uranium, radium, and gross alpha. Confining shale layers were determined to be present above and below the B zone throughout the test area and beyond.

Peninsula Minerals Ltd initiated minerals acquisition in the Lance District in 2007-2008. Exploration drilling programs in 2008-2009 confirmed large deposits of uranium in the Ross permit area. The area of mineral acquisition in the Lance District, as well as an outline of the Ross permit area is shown in Figure 1a. The immediate site vicinity is depicted in Figure 1b.

Strata Energy incorporated in 2009 to facilitate drilling and provide a regulatory foundation for an NRC source materials license (uranium recovery license) and a WDEQ/LQD permit to mine. Strata proposes production of 0.75-1.5 million pounds of uranium per year from the Ross Project. Additional production from other prospects in the Lance District is also expected in the coming years.

1.2 PROJECT SUMMARY AND OBJECTIVES

The ISR process envisioned by Strata is a “phased,” iterative process and, as a result, Strata will develop the Proposed Action by constructing a series of sequentially developed well fields to recover uranium from identified ore bodies at the proposed Ross project site. The development of these well fields and the accumulation of a complete sampling database will not take place until Strata is issued an NRC license and installs injection, production, and a monitor well system. Strata’s engineers and geologists will continuously assess data as it is obtained and apply this new information to the next phase or activity, thus ensuring that subsequent exploration and delineation is based on the most up-to-date information possible to ensure proper placement of injection, extraction, and monitor wells. As well fields are developed, all wells, including monitor wells, will be developed to assure that they function appropriately prior to being sampled. Water quality sampling establishes water quality within and outside the ore zone (i.e., at the monitor wells) and upper control limits (UCL) which will enable Strata to readily determine if an excursion of recovery solutions has occurred, because of the distinct difference between water quality in the recovery zone and that at the monitor wells. A “lessons learned” approach will be implemented, as the results in one well field may cause the site engineer or geologist to change design in the next. This process is both “phased” and iterative, as each well field is developed and tested with the uranium being progressively depleted from different parts of the ore body.

The Central Processing Plant (CPP) will receive and process all uranium-loaded resins generated from ISR operations in well fields at the Proposed Action site to produce yellowcake product for shipment to a conversion facility for introduction into the nuclear fuel cycle. All wastes generated from the ISR process determined to be 11e.(2) byproduct material will be disposed of in a manner consistent with the Atomic Energy Act of 1954, as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) (hereinafter the “AEA”), applicable NRC regulations, and guidance. As each developed well field depletes its portion of the identified uranium ore bodies, Strata will develop and commence production in the next well field and will begin groundwater restoration in the well field in which uranium recovery has been completed. Strata’s goal is to restore groundwater in each depleted well field to water quality levels consistent with pre-operational or baseline water quality standards but, in any case, to satisfy the requirements of 10 CFR Part 40, Appendix A, Criterion 5(B)(5), which are pre-operational baseline water quality or a maximum contaminant limit (MCL), whichever is higher, or an alternate concentration limit (ACL). When all active ISR operations and groundwater restoration are complete in compliance with applicable regulations, Strata will initiate site reclamation activities, including decommissioning and decontamination (D&D) of the CPP, well fields, header houses, piping, and the surrounding land areas with the ultimate goal of releasing the Proposed Action site for unrestricted (i.e., any) potential use.

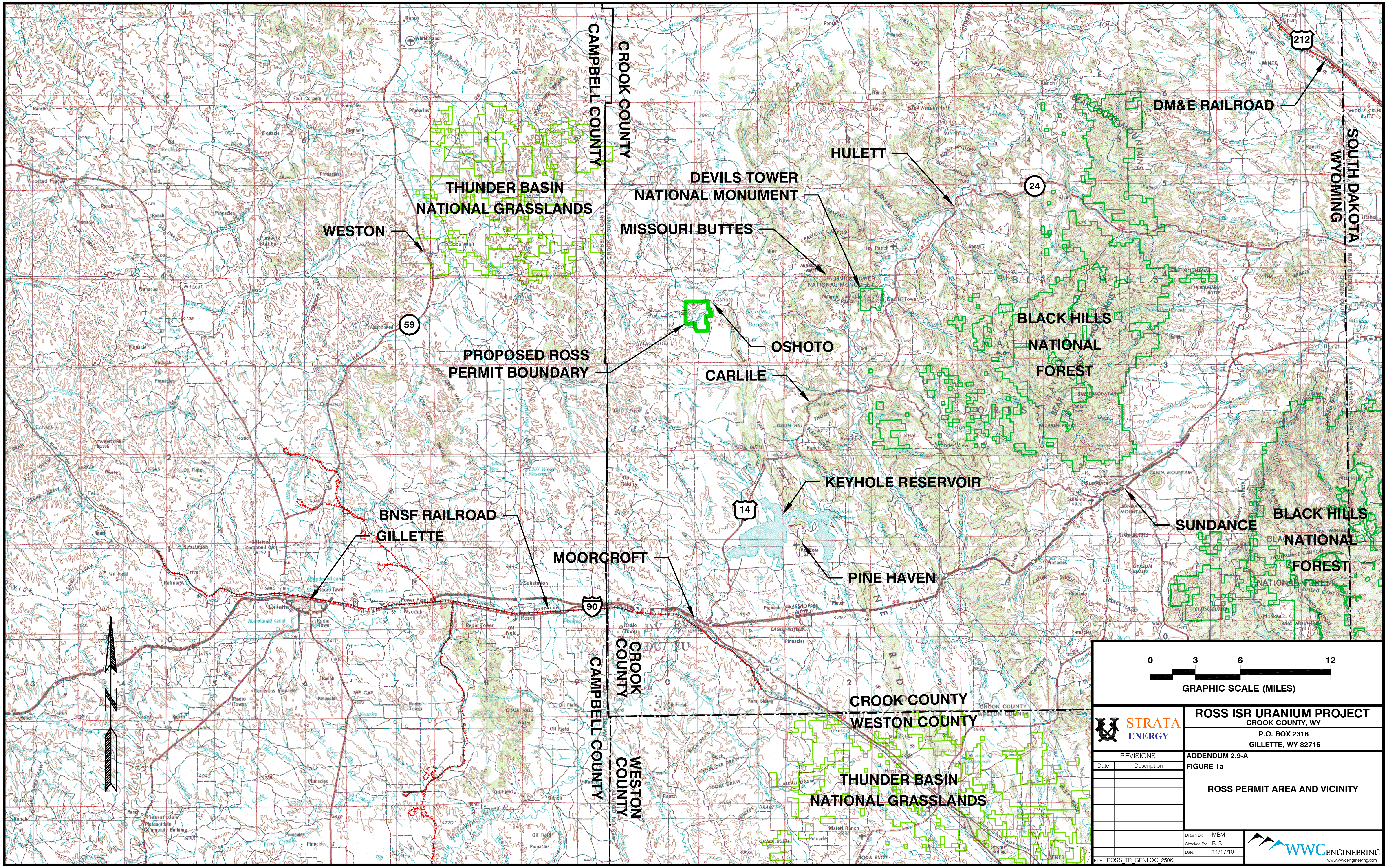
In order to obtain authorization to mine, Strata is seeking a combined source and 11e.(2) byproduct material license pursuant to the AEA, 10 CFR Part 40, Appendix A Criteria, 10 CFR Part 20 radiological protection limits, 10 CFR Part 51, National Environmental Policy Act (NEPA) regulations, and other relevant non-NRC-related regulations, including those of the United States Environmental Protection Agency (EPA) (e.g., 40 CFR Parts 190 and 192), and applicable NRC regulatory guides and guidance. Strata will also be required to obtain authorization for this under other provisions of EPA (or State's with primacy) regulations pursuant to the Safe Drinking Water Act's (SDWA) underground injection control (UIC) program

Strata's overall goal is to construct and operate uranium recovery operations at the Ross project site in such a way as to minimize impacts to human health and the environment, provide for a reasonable return on investment, and allow for future sustainable redevelopment of the project area. To realize this goal, the following objectives have been established:

- Obtain the necessary permits, permissions and approvals from the appropriate Federal and State regulatory agencies and authorities within a reasonable timeframe and budget
- Keep other stakeholders informed during the environmental assessment and project development activities

The purpose of this SAP, along with the associated media-specific SOPs, is to describe the programs and procedures for obtaining baseline radiological data in order to adequately characterize the existing natural environment in the project areas. These programs and procedures are designed to be consistent with existing regulations and technical guidance (e.g., those of the U.S. Nuclear Regulatory Commission and State of Wyoming Department of Environmental Quality), current standards of practice, and defensible science. Data generated during this program will be used to define the "baseline" against which any potential or perceived radiological impacts of project activities can be measured and compared. This SAP describes general field sampling and measurement methods, sampling locations and frequencies and analytical requirements. The SAP establishes the criteria by which sample locations are selected.

Detailed sample collection and field measurement protocols are contained in a set of SOPs identified in Table 1 below and provided as Appendix A to this SAP. In addition to media- and program element-specific SOPs (soil, water, etc.), procedures of potential relevance to all field sampling and measurement programs, such as sample and data management and equipment decontamination are also described in the SOPs.



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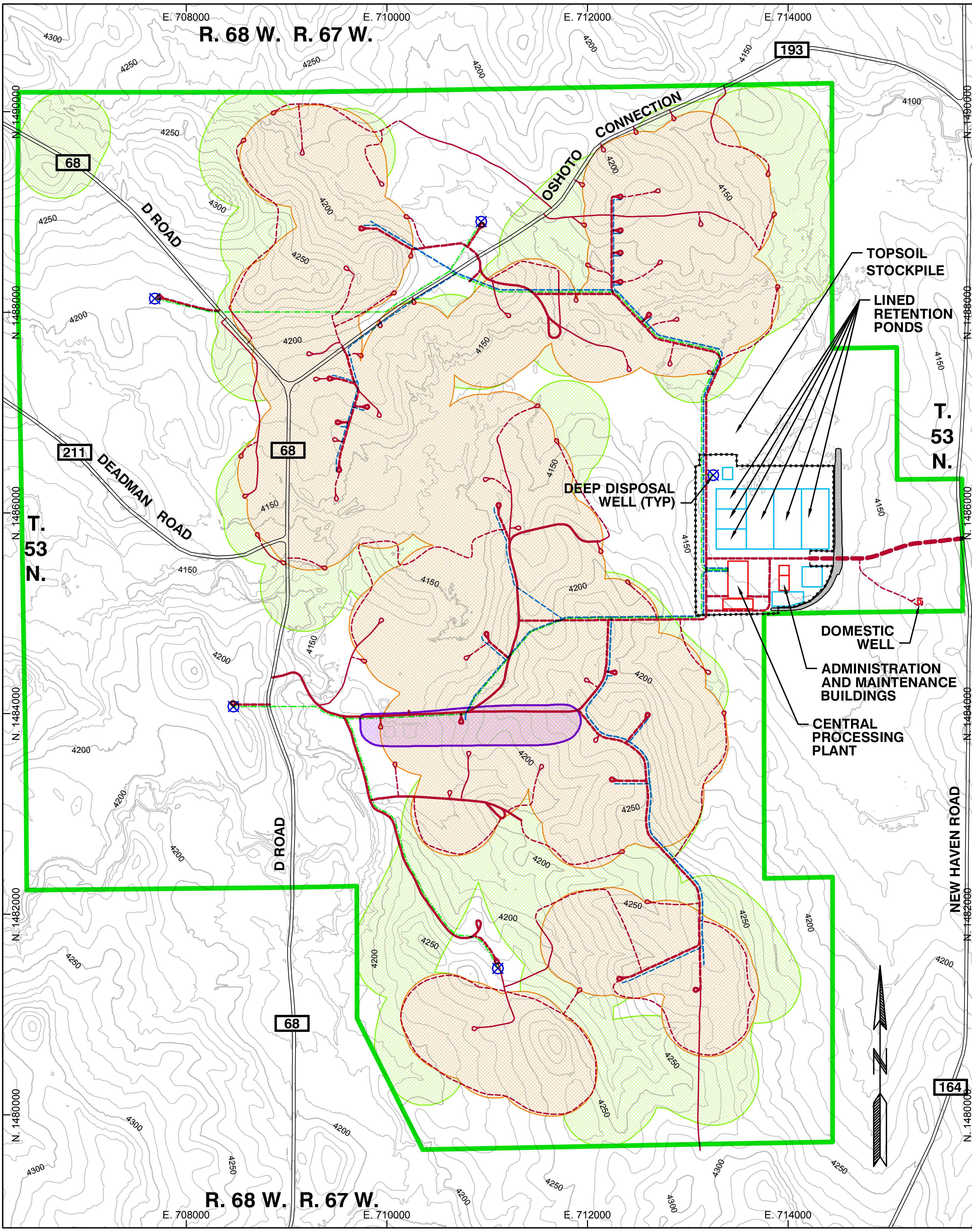

Basemap: 10' Contours from May 2010 Flight

Drawing Coordinates: WY83EF

ROSS PROJECT AREA

LEGEND

- PROPOSED ROSS PERMIT BOUNDARY
- 164 COUNTY ROAD
- NUBETH R&D LOCATION
- APPROXIMATE WELLFIELD PERIMETER
- WELLFIELD PERIMETER ACCOUNTING FOR FUTURE DRILLING

FACILITIES

- PROPOSED CONVEYANCE PIPELINE
- PROPOSED DEEP DISPOSAL WELL PIPING
- PROPOSED PRIMARY ACCESS ROAD
- EXISTING SECONDARY ACCESS ROAD
- PROPOSED SECONDARY ACCESS ROAD
- EXISTING 2-TRACK ROAD
- PROPOSED TERTIARY ROAD
- PROPOSED DEEP DISPOSAL WELL

0 500 1000 2000

GRAPHIC SCALE (FEET)

STRATA ENERGY

REVISIONS

Date	Description

ROSS ISR PROJECT
CROOK COUNTY, WY
P.O. BOX 2318
GILLETTE, WY 82716

ADDENDUM 2.9-A
FIGURE 1b

ROSS PROPOSED FACILITIES AND SURFACE CONTOURS

Drawn By: MBM
Checked By: WCF
Date: 11/23/10

FILE: ROSS_TR_FACILITIES_TOPO

WWC ENGINEERING
www.wwcengineering.com

K:\Peninsula_Minerals\09142\DWGS_WY83E\ROSS_TR_FACILITIES_TOPO.dwg, TRA_2.9-A_FIGURE_1B, 12/20/2010 3:25:22 PM

Table 1. Standard Operating Procedures for the Radiological Baseline Program

SOP No.	Subject
1	Sampling for Radon in Air
2	Measuring Gamma Exposure Rates Using Thermo-Luminescent Dosimeters (TLD)
3	Air Particulate Sampling
4	Surface Soil and Soil Profile Sampling
5	Sediment Sampling
6	Vegetation and Food Crop Sampling
7	Direct Gamma Field Surveys
8	Surface Water Sampling
9	Groundwater and Domestic Well Sampling
10	Animal Tissue Sampling
11	Decontamination of Sampling Equipment
12	Sample Management
13	Data Management

1.3 REGULATORY AND TECHNICAL BASIS

This SAP is consistent with the regulatory intent and technical guidance provided in the following documents:

1. United States (U.S.) Nuclear Regulatory Commission (NRC) Regulatory Guide 4.14, " Radiological Effluent and Environmental Monitoring at Uranium Mills," 1980
2. USNRC RG 4.15 1979, *Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment*
3. NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination", J D Berger, 1992
4. NUREG 1575, "Multi Agency Radiological Site Survey and Investigation Manual" (MARSSIM), 2000
5. U.S. Environmental Protection Agency (USEPA) "Manual for Chemical Analysis of Water and Wastes" EPA-625-/6-74-003a, 1974
6. USEPA "Standard Methods for the Examination of Water and Wastewater, EPA SW -846, Rev 6, 2007
7. NUREG 1569, " Standard Review Plan for In Situ Leach Uranium Recovery License Applications", 2003

Note that the SOPs may include additional references applicable to that specific media sampling program.

2.0 SITE DESCRIPTION

The region in which the proposed Ross site is located averages about 15-20 inches of rain annually, specifically an average of 17.14 inches at the Gillette Weather Station, and 17.64 inches at the Devil's Tower station averaged over the time span of 1971-2000. The 30 year averages for weather indicate the warmest average temperatures occur in the months of July and August with temperatures averaging around 84°F and the coldest temperatures occurring the months of December and January with average temperatures around 10°F. (National Weather Service Weather Forecast Online)

The Ross permit area is located in the upper reaches of the Little Missouri River Basin. The Little Missouri River flows from northeastern Wyoming to the Missouri River in North Dakota. The surface water on the site is dominated by the northeastern flow of the Little Missouri River (LMR). There is a significant tributary to the Little Missouri River, Deadman Creek that enters the LMR within the proposed permit boundary. Of note are exceptions to the natural surface water hydrology including several man-made reservoirs and Wyoming Pollutant Discharge Elimination System (WYPDES) discharge sites from existing conventional oil and gas facilities. The property may contain some special aquatic sites and jurisdictional wetlands associated with the Oshoto Reservoir, and the Little Missouri River.

The Wyoming Game and Fist Department (WGFD) indicate that there is no crucial big game species present on the property.

3.0 TECHNICAL APPROACH

This section describes the technical approach used in establishing baseline sampling locations, sampling frequencies and analytical requirements for the following media:

- Radon in air
- Long term direct gamma radiation measurement
- Air Particulate Sampling
- Surface Soil and Soil Profile Collection
- Sediment Sampling
- Vegetation and Food Crop Sampling
- Direct Gamma Radiation Field Surveys
- Animal Tissue Sampling

These components of the radiological baseline study are described in the following sub-sections. The guidance provided by USNRC Regulatory Guide 4.14, *Radiological Effluent and Environmental Monitoring at Uranium Mills* is summarized for each program component. However, it must be recognized that this Regulatory Guide was written some years ago relative to the design and layout of conventional uranium mills.

Accordingly, some modifications must be made in the design and execution of this preoperational radiological baseline program to accommodate the uranium ISR design, site layout and technology. These deviations are explained in the text and justification is provided to assure that the "intent" of Regulatory Guide 4.14 has been preserved. Many of these deviations are supported by guidance presented in NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications." This document describes itself as providing "general guidance on acceptable methods for compliance with existing regulatory framework." Modifications and deviations from Regulatory Guide 4.14 that are presented in NUREG 1569 will be considered valid and compliant with current NRC standards for the Ross ISR facility. It is also noted that this SAP is a "living document" in that it may need to be modified / revised per actual field conditions encountered and/or evolving regulatory requirements.

3.1 SAMPLING FOR RADON IN AIR

NRC Regulatory Guide 4.14 suggests radon measurements be taken at locations where air particulates are monitored on a continuous basis or one week per month at about same time of the month.

3.1.1 Number and Location of Samples

Regulatory Guide 4.14 states that measurements should be made at the center of the milling area and at locations 750 and 1500 meters in each cardinal direction from the center of the site. Regulatory Guide 4.14 assumes a centralized continuous site. ISR activities at the site will occur at the Central Processing plant and over the ore bodies which are generally long, narrow, and discontinuous. Accordingly, radon detectors will be placed at the air monitoring stations and at other locations commensurate with the TLD program (See also section 3.2***)*** consistent with the layout of modern ISRs. The locations of the radon detectors are shown on Figure 2. Other locations include the 4 residences near the site, potential locations for the central processing plant and evaporation ponds, at the former R&D ISR site, and over two of the ore bodies where active mining is anticipated. These locations provide a baseline characterization of the areas with the greatest potential for impact from the mining and milling process. Overall, there will be a total of 17 radon monitors on the site, which is greater than the 9 detectors recommended by the traditional configuration listed in Regulatory Guide 4.14.

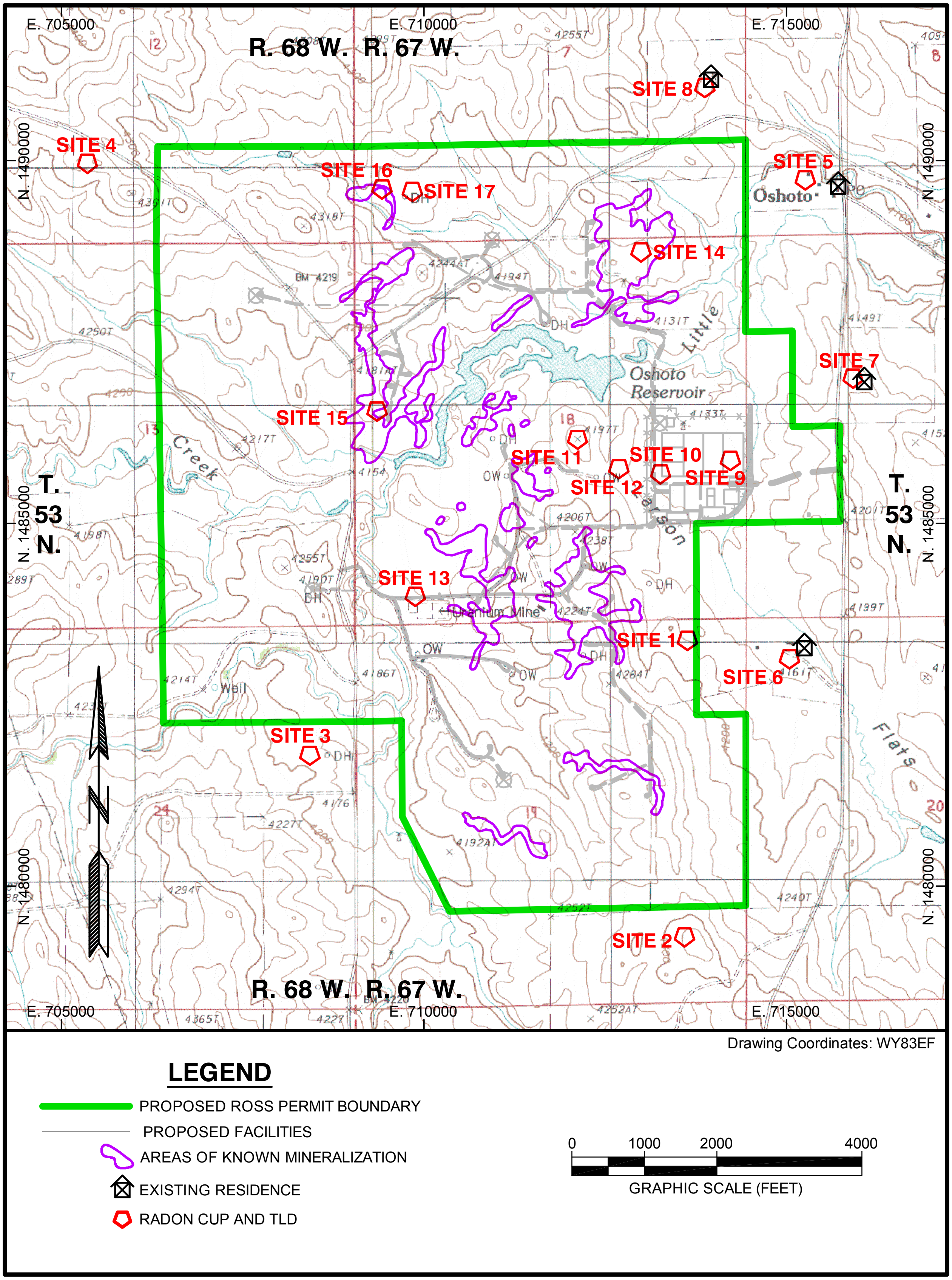

Figure 2. Radon and Direct Gamma Radiation Long Term Monitoring Locations

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3.1.2 Sample Collection Methods and Frequency

Radon concentrations tend to be highly variable, both diurnally and seasonally, and require long-term monitoring to be effectively characterized. The method employed for the Ross ISR project uses “alpha track” detectors (e.g., Radtrak detectors available from Landauer, Inc.) for the measurement of radon. The detector incorporates a radiosensitive element that records alpha emissions (that become visual tracks when subsequently processed) from the decay of radon and its short-lived decay products. Air being tested diffuses through a filtering mechanism into the plastic container holding the detector. The number of tracks over a pre-determined area is counted using a microscope or optical reader. The radon concentration (in pCi/liter of air) is determined by the number of tracks per unit area in combination with the time of exposure. These detectors are small and require no power source. For outdoor monitoring, a re-usable protective housing is required for each monitor. The monitors are mounted at approximately 1 meter off the ground from either steel posts mounted in the ground for this purpose or on fence posts at locations where fencing is already present.

Continuous samples will be collected in accordance with SOP 1, “Radon Concentrations in Air”. Passive alpha track detectors will be placed as described above. A Landauer, Inc. Radtrak Long Term Radon Monitor or equivalent will be installed at each designated sampling location. Detectors will be exchanged and returned for analysis to the vendor on a quarterly basis.

3.1.3 Sample Analysis

Detectors will be analyzed by the supplier. The sensitivity of the RadTrak detector is typically in the 20 to 40 pCi/l/day range. Assuming a quarterly (90 day) exposure period, the minimum detectable concentration will be 0.2 to 0.4 pCi/l radon in air.

3.2 LONG TERM DIRECT GAMMA RADIATION MEASUREMENTS

NRC Regulatory Guide 4.14 suggests direct radiation measurements be obtained at 150 m intervals out to 1,500 m in eight cardinal directions from center of the uranium milling area and also at air particulate stations once prior to construction to determine average exposure rate. A method will be employed that provides for a much more extensive data set, consistent with the expanse and layout of modern ISRs, as described below and in Section 3.7, Direct Gamma Radiation Field Surveys.

TLDs are supplied by a vendor and exchanged on a quarterly basis (typically about 90-day monitoring periods). After approximately a 90 day exposure period in the field, the dosimeters are replaced with “unexposed” units. The exposed units are returned to the vendor for analysis.

Environmental TLDs have sensitive elements constructed of special aluminum oxide materials that when exposed to ionizing radiation (photons), store the absorbed energy in the material's crystal lattice. Upon stimulation by heating or by special light sources (depending on dosimeter type), the stored energy is released in the form of light photons which are converted into an electronic signal by a photo multiplier tube and recorded to provide a measure of light emissions. Light emission is proportional to the amount of energy (ionizing radiation) absorbed by the dosimeter materials, and the total dose received is calculated using algorithms based on controlled calibrations.

3.2.1 Number and Location of Measurements

TLDs will be installed at the air particulate stations (See section 3.3) and at additional locations across the project site, consistent with the approach and rational described in section 3.1.1 regarding the radon in air monitors. The locations match those of the radon monitor locations shown in Figure 2 that were selected to be spatially representative and to obtain general coverage across the project site. The number and location of TLD dosimeters deployed and the rationale for these locations takes into account Regulatory Guide 4.14 requirements.

3.2.2 Sample Collection and Analysis

Environmental/low level dosimeters will be obtained from the vendor (Landauer, Inc.) and exchanged on a quarterly frequency. These units are rugged enough to withstand the rigors of outdoor usage and environmental extremes, and sensitive enough to provide accurate reporting to a lower limit of 0.1 mrem (1μSv).

3.3 RADIONUCLIDE PARTICULATE IN AIR SAMPLING

The following sections discuss number and locations of samples to be collected and the sampling method and frequency for sampling radionuclide particulates in the air.

3.3.1 Number and Locations of Samples

NRC Regulatory Guide 4.14 recommends a total of five air particulate monitoring stations:

- Three air monitoring stations at or near the site boundary in the downwind direction
- One air monitoring station at the nearest residence within 10 km of the site representing "highest predicted concentration"
- One air monitoring station at a control location, upwind and remote from the site

Continuous sampling is further suggested, with quarterly composites of weekly samples (or as necessary based on dust loading) be submitted for analysis.
The chosen monitoring stations are shown in Figure 2. Placement of particulate air samplers considered (a) site boundary locations that during operations, will represent "points of compliance" relative to permissible releases of radioactive materials in air to unrestricted (public) areas; (b) in directions from project activities representative of

prevailing/highest frequency wind; (c) the location of nearby residence(s) that would represent the potentially “maximally exposed offsite individual” from project airborne releases under normal operations and/or accidental releases

Assumptions on prevailing winds at the property are made from two main sets of data. Information from the National Weather Service station located in Gillette, WY, approximately 50 miles from the site, records prevailing winds from the northwest and south west (see Figure 3 Gillette Wind Rose). Section 2.5.3 of the original Nubeth application describes predominately westerly winds at the site. Based on the information from the Nubeth application and the Gillette wind rose, the meteorological monitoring station was placed on the northwest boundary of the permit area such that it is upwind, on relatively high, unobstructed terrain. The sites chosen for air particulate monitoring include the following:

- At the meteorological monitoring station located upwind from the potential locations for the central processing plant and evaporation pond.
- At both the Oshoto field office and the Strong residence, two locations that represent the potential “maximally exposed” individuals.
- Two locations on the south and west areas of the permit boundary representing other potential points of compliance

3.3.2 Sample Collection Methods and Frequency

Air particulate samples are collected using F & J Specialty Products Models DF -40L-BL-AC and LV-1D which have been installed at permanent locations. A filter is collected from each air-sampling unit on approximately a weekly basis during a three-month quarter. The collected set of filters (typically about 13, one per week) for each air sampling unit is sent to a contract laboratory for analysis at the end of each calendar quarter.

The sampler units will have flow rates sufficient to ensure minimum detectable activities are achieved. The sampler units and their operation are described in

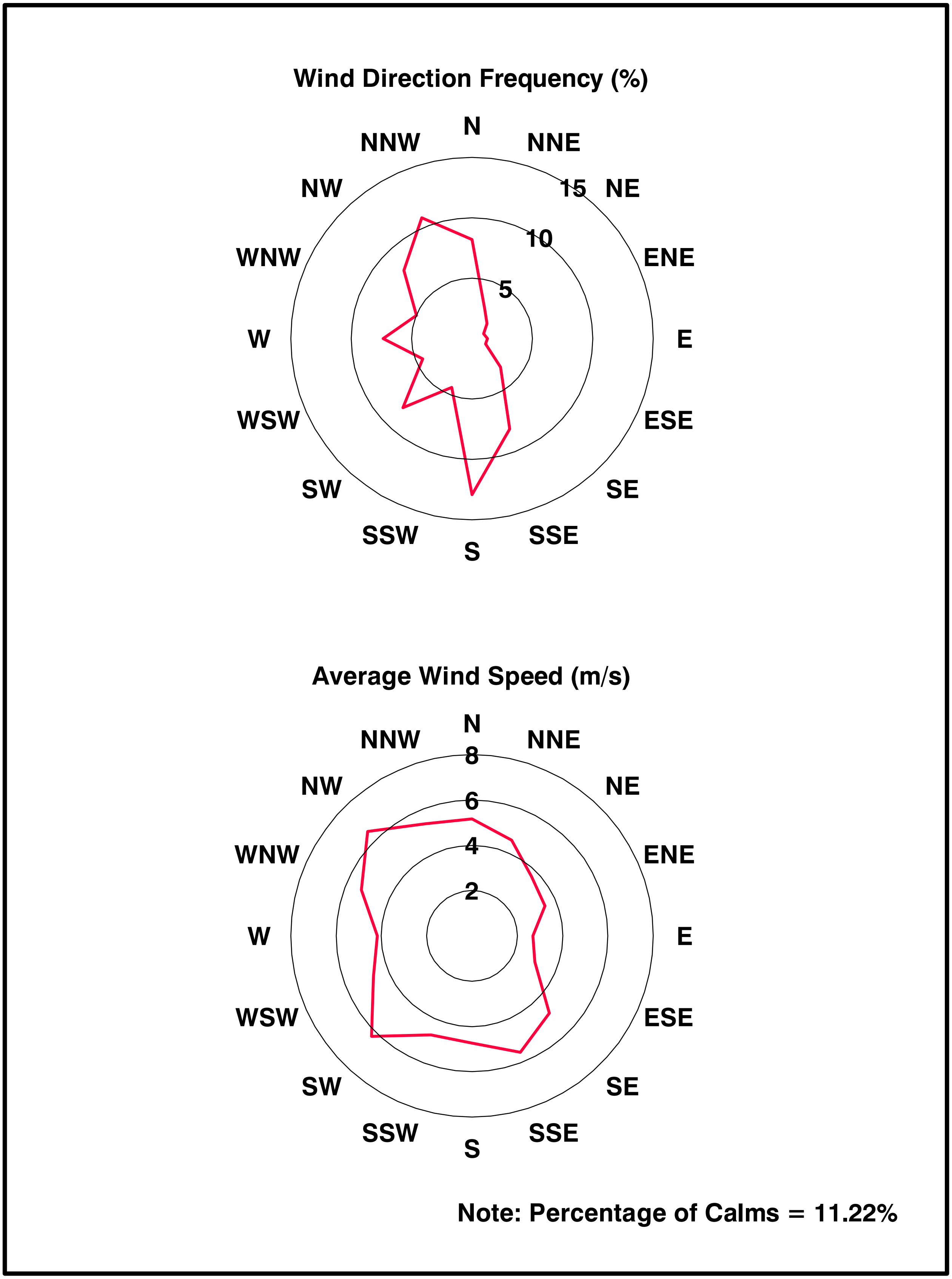

Figure 3. Wind Rose for Gillette - 2009

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SOP 3, *Air Particulate Sampling*. Continuous air sampling will be via filter paper collection. Sampling will be conducted continuously for 12 months with quarterly composites from each station separately analyzed. Filters will be changed on an approximately weekly basis or as necessary based on dust loading. (See SOP 3)

3.3.3 Sample Analysis

Table 2 presents analytes and analytical methods for air particulate (filter) samples to detect radionuclides in ambient air.

Table 2. Analytes and Analytical Methods for Air Particulate Filters
(Analytes are per NRC Regulatory Guide 4.14, Table 1)

Radionuclide	Analytical Method	Reporting Level
Uranium (total)	E908.1	E-7 pCi/liter
Thorium 230	E907.0	E-7 pCi/liter
Radium 226	E903.0	E-7 pCi/liter
Lead 210	E905.0 Mod	2 E-6 pCi/liter

3.4 SURFACE SOIL AND SOIL PROFILE SAMPLING

NRC Regulatory Guide 4.14 suggests, for mills and tailings disposal sites, that surface soil samples be collected to a depth of 5 centimeters. NRC further recommends that samples be obtained once prior to construction. While Regulatory Guide 4.14 specifies surface soil samples to a depth of 5 cm, the current reclamation standards (e.g., 10 CFR 40, Appendix A, Criterion 6) specify surface soil samples to a depth of 15 cm. Therefore, the baseline surface soil samples will be taken to a depth of 15 cm. This deviation from the Regulatory Guide is necessary to establish a pre-operational baseline for comparison in the future with current reclamation standards consistent with the potential radiological impact of modern ISRs. Additional revisions from the approach described above is presented and justified below.

NRC Regulatory Guide 4.14 suggests subsurface soil samples be obtained at the center of operations and at 750 m in four cardinal directions in order to define the radiological profile of subsurface soils in the project areas. Three samples at each location should be obtained one time prior to construction to depth of one meter at 0 to 30, 30 to 60 and 60 to 100 cm depth intervals. In addition, NUREG 1569 suggests that a general description of the site soils and their properties be provided to support an evaluation of the environmental effects of construction and operation on erosion. All soil sampling will be carried out in accordance with SOP 4, Surface Soil and Soil Profile Sampling.

3.4.1 Number and Location of Samples

NRC Regulatory Guide 4.14 recommends locations for surface soil samples to be collected at 300 meter (m) intervals out to 1,500 m, in the eight cardinal directions from a point representing the geometric center of onsite processing activities and also at the air monitoring stations. This sampling pattern is not likely to sample some areas potentially impacted by the mining and milling process. NRC Regulatory Guide 4.14 also recommends a total of 5 soil profiles, collected one time at the center of the tailings pile and one in each cardinal direction. Again, this is not a sampling plan that would be appropriate for an ISR facility.

In addition, ISR uranium processing takes place below grade and therefore no radionuclide particulates are generated during the recovery process. Even assuming that the Ross project design incorporates a yellowcake circuit, modern vacuum dryers currently being used in the industry have virtually no particulate emissions. Thus the only potential radiological releases from these mining activities would be associated with liquids from leaks and spills and potentially radon gas. (e.g., see USNRC NUREG 1910, Generic Environmental Impact Statement for In Situ Leach Uranium Milling Facilities, sections 2.4.2.3 and 4.2.11.2). We have adjusted the sampling location requirements to reflect the inherent difference between conventional mining/milling operations and ISRs.

For the Ross ISR site, soil samples locations have been selected with bias at areas of the site most likely to be impacted by the ISR process or otherwise of importance. Areas of importance for the site include the 3 residences close to the property, the field office, the former R&D ISR site, and the air sampling stations. Locations that are considered to be most likely impacted by the ISR are the potential locations of the central processing plant, the potential locations of the evaporation pond, and locations along the major ore bodies where extraction wells will be located and lixiviant may leak from well heads and header houses. Soil profiles that include surface soil samples will be collected at all areas of interest, the potential locations of the CPP and evaporation ponds, and at some points along the major ore bodies. Additional surface soil samples will be taken along the ore bodies as described below. All sample locations will be recorded with coordinates provided by a GPS unit.

In an attempt to have a comprehensive characterization of the soils along the ore bodies, axises have been drawn through the middle of the major ore bodies indentified on the site. The ore bodies that have been identified at this time are the locations where the first production well drilling on the site will occur. Along these axises, sample locations were chosen approximately every 300 m in an attempt to mimic the intent of the original guidance in Regulatory Guide 4.14, where samples were to be taken every 300 m in all compass directions from the center of the tailings pile. Locations of soil samples are shown in Figure 4. One location within the 0.3 GT polygon for each of the identified 5 major ore bodies will have a full soil profile collected. The locations of the soil profiles are shown in Figure 4 as well. The choice of these locations is more appropriate and relevant to the Ross ISR site than the historical approach for a conventional

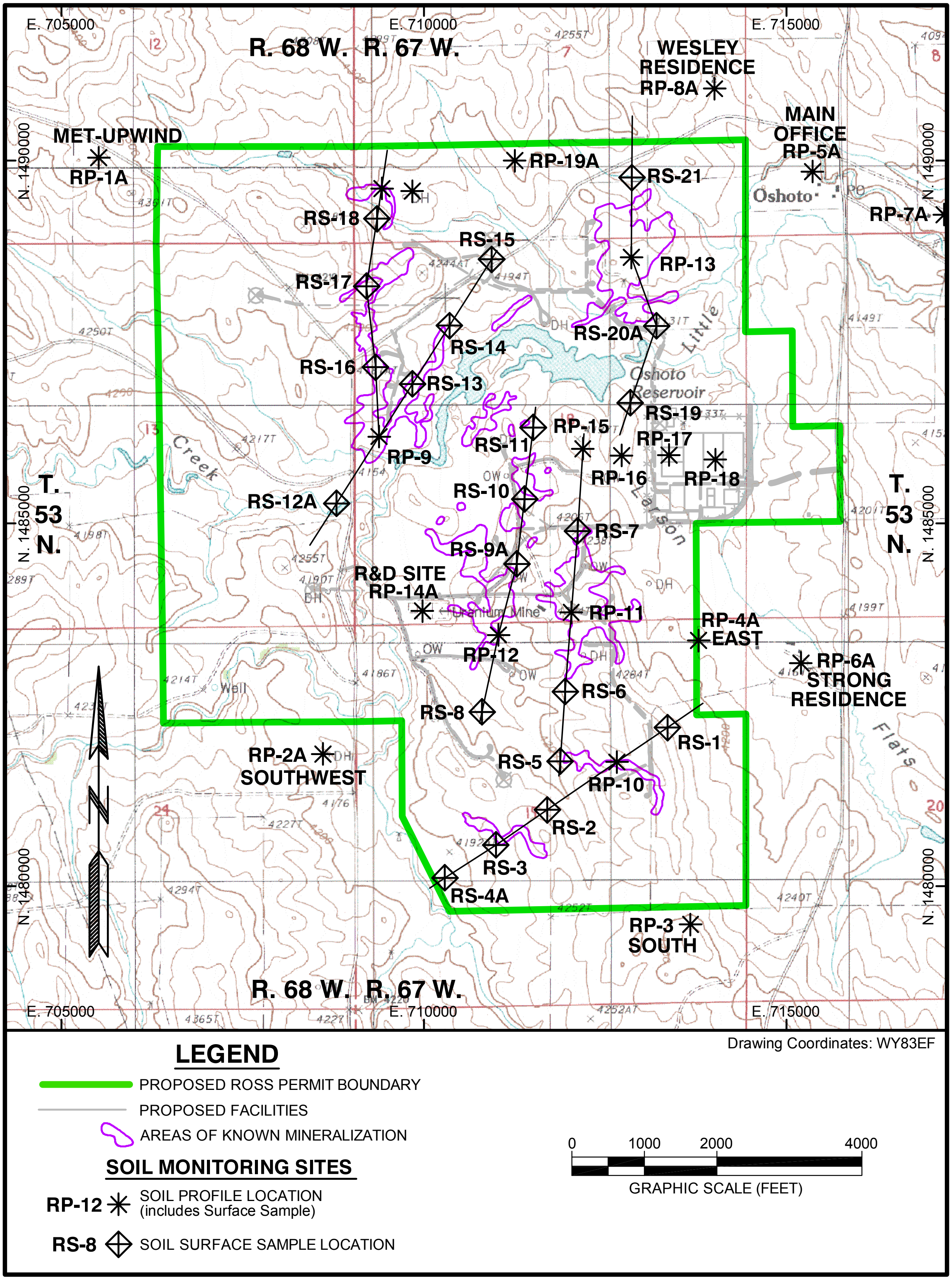

Figure 4. Soil Surface Sampling and Profile Locations

K:\Peninsula_Minerals\09142\DWGS_WY83E\ROSS_TR_RAD_SOIL_SAMP.dwg, TRA_3.1-A_FIGURE_4, 12/20/2010 3:45:16 PM uranium mill presented in Regulatory Guide 4.14. and will provide a more representative and useful radiological baseline relative to the design, layout and technology of modern ISRs.

3.4.2 Sample Collection Method and Frequency

Surface soil samples will be collected in accordance with SOP 4, Surface Soils and Soil Profile Collection. Samples will be obtained at each location from the top 15 cm of surface soil or at the bedrock surface, wherever is shallower. Soil profiles will be collected over a range of 0-30 cm, 30-60 cm, and 60-100 cm. Soil profiles will also include a surface soil sample. All soil samples will be collected once prior to construction.

3.4.3 Analytical Program

Table 3 summarizes the analytes and analytical methods for surface soil and soil profile samples. All surface soil samples will be analyzed for uranium, Ra 226 and gross alpha. In addition, soil samples from the 5 air monitoring stations as well as 10 percent of the remaining surface soil samples will be analyzed for Th 230, and Pb 210. Regulatory Guide 4.14 requires of one of the five required soil profiles be analyzed for Th 230 and Pb 210. To match the intent of this requirement, 20% of the soil profiles will be analyzed for these additional radionuclides as this is more than 1/5 of samples.

Table 3. Analytes and Analytical Methods for Surface and Subsurface Soil Samples
(Analytes are per NRC Regulatory Guide 4.14, Table 1)

Radionuclide	Analytical Method	Reporting Level
Uranium (total)	E908.1	0.2 mg/kg - dry
Thorium 230	E907.0	0.2 pCi/g
Radium 226	E903.0	0.2 pCi/g
Lead 210	E905.0 Mod	0.2 pCi/g
Gross Alpha	E900.0	0.2 pCi/g

3.5 SEDIMENT SAMPLING

NRC Regulatory Guide 4.14 suggests that sediment samples be taken upstream and downstream from all surface waters passing through the site or surface waters likely to be subject to direct runoff. There should be two samples from each location, one in the spring and one in the summer when water flow is low. The guidance also suggests that sediment samples are taken from all water impoundments that are subject to direct runoff from contaminated areas. One sample should be taken from each impoundment prior to construction of the site. Sampling will be held out in accordance with SOP 5, Sediment Sampling.

3.5.1 Number and Location of Samples

The sediment sampling program will be held in conjunction with the water sampling program. Samples will be taken from all present water impoundments on the site. There are approximately 15 surface water sites listed on or near the permit boundary (most sites just outside the permit boundary are associated with the “Strong” residence on the eastern boundary of the property). These locations are depicted in Figure 5 as they are co-located with water sampling locations. Streams running through the site will also be sampled. These samples will be collected from the storm water collection devices. Sediment samples will be collected from both of the streams passing into the site, i.e., the Little Missouri River and Deadman Creek along with the LMR where it leaves the permit boundary. Sampling locations, as shown on Figure 5 are located both up and down stream from the site.

3.5.2 Sample Collection and Frequency

Approximately two cups (0.5 liters) of sediment will be collected by hand or with a scoop. Layers that are composed of decaying biological matter that has a foul smell will be avoided. Samples will be placed in appropriately marked containers.

Samples will be collected from each water impoundment once prior to construction. Two samples representing spring and late summer are suggested by NRC Regulatory Guide 4.14 for sediment in flowing bodies of water. As the streams on this property are ephemeral, sediments samples will be collected when possible from storm water samplers.

3.5.3 Analytical Program

All sediment samples will be analyzed for uranium, Ra-226, Th-230, and Pb-210. Table 4 summarizes the analytes and analytical methods for sediment samples.

Table 4. Analytes and Analytical Methods for Sediment Samples
(Analytes per NRC Regulatory Guide 4.14, Table 1)

Radionuclide	Analytical Method	Reporting Level
Uranium (total)	E908.1	0.2 mg/kg - dry
Thorium 230	E907.0	0.2 pCi/g
Radium 226	E903.0	0.2 pCi/g
Lead 210	E905.0 Mod	0.2 pCi/g
Gross Alpha	E900.0	0.2 pCi/g

3.6 VEGETATION AND FOOD CROPS

NRC Regulatory Guide 4.14 suggests the sampling of all food products grown within 3 km of the site at the time of harvest and vegetation from grazing areas near the site with the highest predicted air particulate concentration during operation. Sample collection will be carried out in accordance with SOP 6, Plant and Food Crop Sampling.

3.6.1 Number and Location of Samples

A field reconnaissance will be used to assess species presence and abundance and to select general areas for plant sampling for each area. A list of species will be recorded that are at least locally common in the areas of interest. Potential sampling areas for various species will be marked on a map or aerial photograph.

Vegetation samples will be taken that best represent the diets of grazing animals located on or near the permit area. Samples will be focused in areas that are most likely to be impacted by the mining and milling process. NRC Regulatory Guide 4.14 recommends focusing sampling in areas with the highest. While sampling will be focused in these areas, it will also be focused in other areas of greatest potential impact, namely the sites of the future central processing plant and evaporation pond, and along the major ore bodies will drilling will occur. The grazing animals on and near the permit area feed on a diet of grasses and shrubs. While is impractical to collect large enough samples of all species of plants on the property, samples will be taken from 5-6 grass and 3-4 shrub species that represent the majority of the diet of the grazing animals. In addition, a substantial area located where the Oshoto Reservoir drains in to the Little Missouri River is considered a wetland area. Several wetland species will also be sampled as these species vary greatly from other species located across the rest of the property.

Food crops will be evaluated separately. There are several fields within or within 3 km of the site that produce food crops, especially for hay production. Samples of each different food crop will be acquired. In addition, some residents also have home gardens for personal use. As required by Regulatory Guide 4.14, food from these gardens will be sampled as well, specifically focusing on collecting a variety of different vegetables and fruits.

3.6.2 Sample Collection Methods and Frequency

Samples will be taken 3 times during the growing season for grazed vegetation, in accordance with Regulatory Guide 4.14. The samples will be taken in each month listed based on the type of vegetation sampled:

- Cool seasons grasses: May, June, July
- Warm Season Grasses: June July, August
- Shrubs: August, September, October

Samples for each type of vegetation will be taken at least 2 weeks apart. Three samples of each type of food crop sampled will be collected during the harvest season, in accordance with Regulatory Guide 4.14. Only the edible portions of all crops and vegetation will be sampled for analysis. Sample sites locations will be documented with a GPS field unit, and the coordinates downloaded into a CAD map of the site area.

3.6.3 Analytical Program

Table 5 presents analytes and analytical methods for analyzing vegetation and food products. All surface vegetation and food product samples will be analyzed for uranium, thorium-230, radium-226, lead-210 and polonium-210.

Table 5. Analytes and Analytical Methods for Vegetation and Food Product Samples
(Analytes are per NRC Regulatory Guide 4.14, Table 1)

Radionuclide	Analytical Method	Reporting Level (wet weight basis)*
Uranium (total)	E908.1	0.2 pCi/kg
Thorium 230	E907.0	0.2 pCi/kg
Radium 226	E903.0	0.05 pCi/kg
Lead 210	E905.0 Mod	1 pCi/kg
Polonium 210	RMO 3008	1 pCi/kg

* Per NRC Regulatory Guide 4.14 but typically not readily achievable due to sample mass requirements

3.7 DIRECT GAMMA RADIATION FIELD SURVEYS

Since the issuance of Regulatory Guide 4.14 many years ago, advanced GPS-based gamma scanning systems with automated electronic data collection have been developed and used extensively in the field. These systems can record several thousand individual gamma readings and corresponding GPS measurements per hour, providing a detailed record of gamma exposure rate conditions across large scanned areas. Multiple scanning systems mounted on vehicles or backpacks can quickly survey large areas and rough terrain while providing a high spatial density of measurements. This gamma survey technology represents a substantial increase in the amount of radiological information that can be efficiently collected relative to technology available when earlier agency guidance documents were published. These techniques are particularly valuable for use at proposed ISR sites due to the large areal extant and irregular geometry of ISR well fields and permit areas.

3.7.1 Site Specific Sampling Information

For the Ross ISR project, gamma surveys at the site(s) will utilize multiple GPS-based gamma scanning systems mounted on specially designed support systems attached to all terrain vehicles (ATVs) or backpacks depending on the nature of terrain to be covered or other site circumstances.

3.7.2 Sample Collection (Measurement) Method and Frequency

The NaI-based scintillometers used for mobile gamma scanning will be cross-calibrated in the field against an energy-independent microrem meter that has been previously cross-calibrated against a high-pressure ionization chamber (or directly with a high-pressure ionization chamber in the field). These data will be used to statistically convert raw NaI scan data to estimates of true gamma exposure rates. This will allow a common (instrument independent) basis of comparison for evaluations with future gamma surveys (surveys that may use different gamma survey instruments, configurations, or measurement technologies). Configuration and use of these systems for this project is described in detail in SOP 7, *Direct Gamma Field Surveys.* Surveys will be conducted by transects spaced no further than 0.1 miles apart. Transects will be modified as necessitated by topography and field conditions. Higher density of measurements will be clustered near the planned central processing site, with more dispersed measurements at greater distances from it. Typical (example) equipment to be used includes Ludlum Model 2221 portable scaler ratemeters with probe type Ludlum Model 44-10 sodium iodide (NaI) gamma scintillator. This equipment will be coupled with GPS equipment, e.g., Trimble PRO XRS Receiver and TSC1 Data Logger. The TSC1 Data Logger is connected to the Model 2221 and the GPS receiver. This assembly can record 2-second integrated count rates coupled with GPS coordinates. This process will be completed once prior to construction most likely in the summer months, when there is no snow cover and the ground is dry.

3.8 SURFACE WATER

NRC Regulatory Guide 4.14 guidance requires that surface water and sediment samples be obtained from the following types of locations

- Large, permanent water impoundments on-or offsite that could be impacted by direct surface drainage from contaminated areas
- Surface water passing through site or offsite surface waters (e.g., “streams”) that could be impacted by surface drainage

The water samples are to be collected via grab sampling when water is present.

3.8.1 Number and Location of Samples

The main source of surface water on the site originates from the Little Missouri River and its largest tributary, Deadman Creek. The river forms the Oshoto Reservoir, the largest surface water body within the permit area. The Little Missouri River and Deadman Creek are both ephemeral streams. The sampling of these two bodies of water would satisfy the requirement of the Regulatory Guide 4.14 that surface waters passing through the site are monitored. In addition, large water impoundments on the site, including the Oshoto Reservoir and smaller stock ponds will be sampled. Locations of surface water sampling locations are shown on Figure 5 and include three permanent stream monitoring stations and eleven impoundments.

3.8.2 Sample Collection Method and Frequency

When possible, grab samples will be collected quarterly from permanent surface water features. Sampling methods are described in SOP 8 (Surface Water Sampling) and SOP 5 (Sediment Sampling). NRC Regulatory Guide requires that bodies of water flowing through the site be sampled monthly. In the case of this particular site, this is not likely. An attempt to monitor the streams as frequently as possible will be made with the implementation of passive samplers on the Ephemeral streams (noted above). The frequency of sample collection and analysis will be dictated by storm events generating sufficient flow from which a sample can be obtained. Other surface water bodies will be sampled when conditions allow. Samples from the Oshoto Reservoir should be available for all seasons, however smaller water impoundments are likely to be frozen to channel bottom in the winter quarter.

3.8.3 Sample Analysis

Table 6 presents the analytes and analytical methods for surface water samples.

Table 6. Analytes and Analytical Methods for Groundwater and Surface Water Samples
(Analytes are per NUREG 1569, table 2.7.3-1).

Radionuclide	Analytical Method	Reporting Level
Uranium (total)	E908.1	0.3 mg/l
Radium 226	E903.0	0.006 Bq/l
Gross Alpha	E900.0	0.03 Bq/l
Gross Beta	E900.0	?

3.9 GROUNDWATER AND DOMESTIC WELL SAMPLING

General guidance from NRC Regulatory Guide 4.14 includes establishing quarterly groundwater baseline monitoring that includes:

- Existing wells within 2 kilometers (km) of tailings area that could be used for potable water, livestock or irrigation,
- At least one well located hydrologically up gradient from tailings area as control/background
- At least 3 wells located hydrologically down gradient from the tailings area.

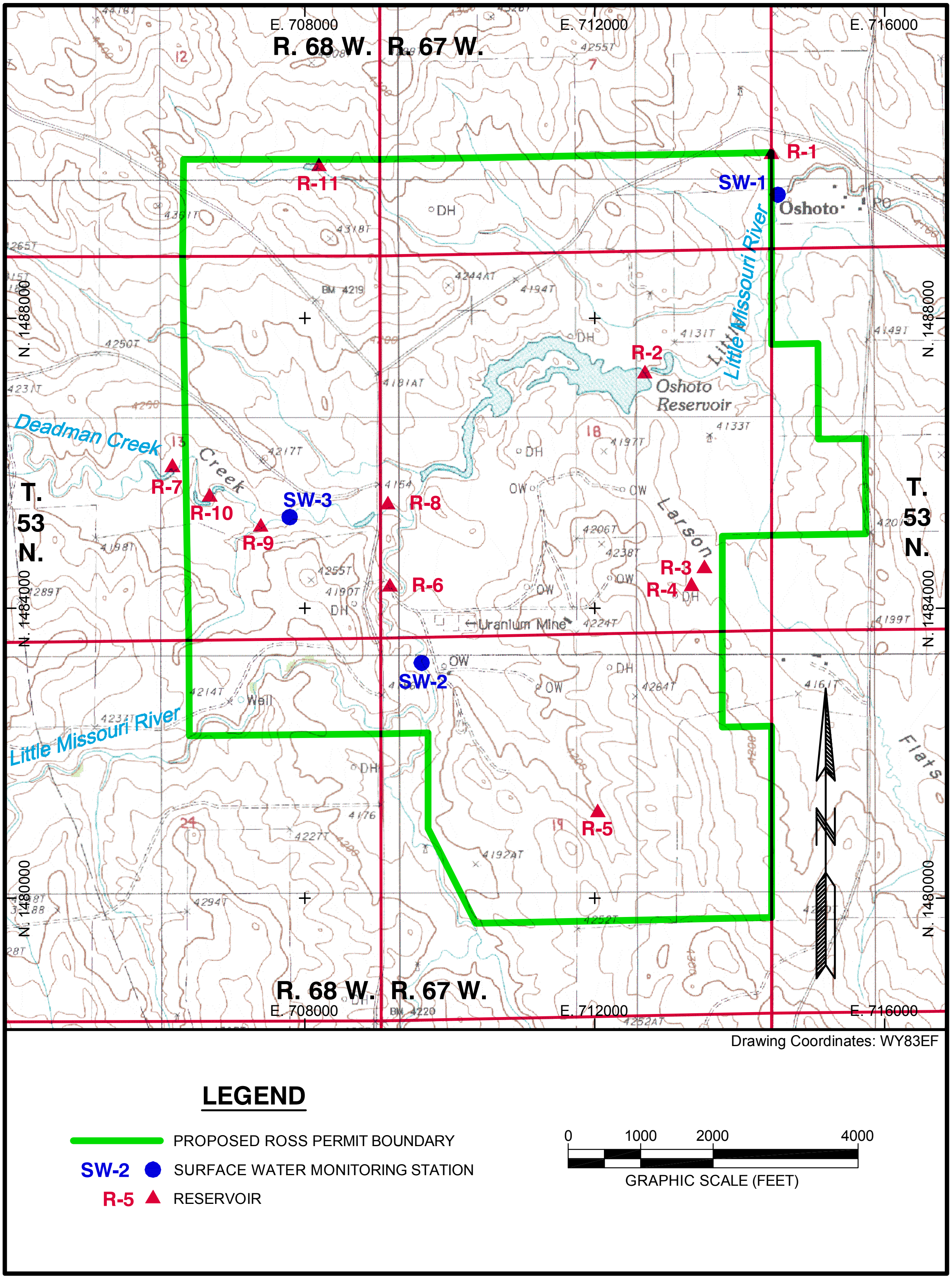

Figure 5. Surface Water Monitoring Network

3.9.1 Number and Location of Samples

Figure 6 presents the locations of regional baseline wells and plant area piezometers. Since ISRs do not have “conventional mill tailings”, monitoring locations have been selected based on anticipated hydrologic flow patterns relative to the mining zone and adjacent aquifers that need to be protected. Baseline monitoring also included existing water supply wells within a 2 km radius of the permit boundary, as depicted in Figure 7. These wells include those at the closest residences to the permit area. In addition, several residences located on the northwest side of the 2 km radius line are close enough to be potentially impacted. While they are not within the 2 km sample requirement, these resources will likely be analyzed in the baseline study. In addition to wells within 2 km outside the permit area, there is 1 stock well and three industrial use wells present within the permit area. These wells will also be sampled and analyzed. Inside of the permit area, 6 monitoring well clusters with a total of 24 wells have been installed for characterizing the up-gradient and down-gradient flow from the locations of the central processing plant and evaporation pond. These regional baseline well clusters will provide samples over a range of depths in the subsurface.

3.9.2 Sample Collection Method and Frequency

Grab samples will be collected quarterly from new and existing monitoring wells as well as agricultural or domestic use wells located within 2 km of the site when seasonally available for sample retrieval. Many wells located on maps of the permit area are no longer functional or are not available during all seasons of the year. Wells that are not capable of being sampled will be recorded during seasonal sampling. Minimum sample volumes, preservation requirements, and holding times are presented in SOP 9, *Groundwater and Domestic Well Sampling.*

3.9.3 Sample Analysis

The radiological analytes and recommended analytical methods to be used for groundwater and domestic well samples are listed in Table 7.

Table 7. Analytes and Analytical Methods for Groundwater and Surface Water Samples
(Analytes are per NUREG 1569, table 2.7.3-1).

Radionuclide	Analytical Method	Reporting Level
Uranium (total)	E908.1	0.3 mg/l
Radium 226	E903.0	0.006 Bq/l
Gross Alpha	E900.0	0.03 Bq/l
Gross Beta	E900.0	?

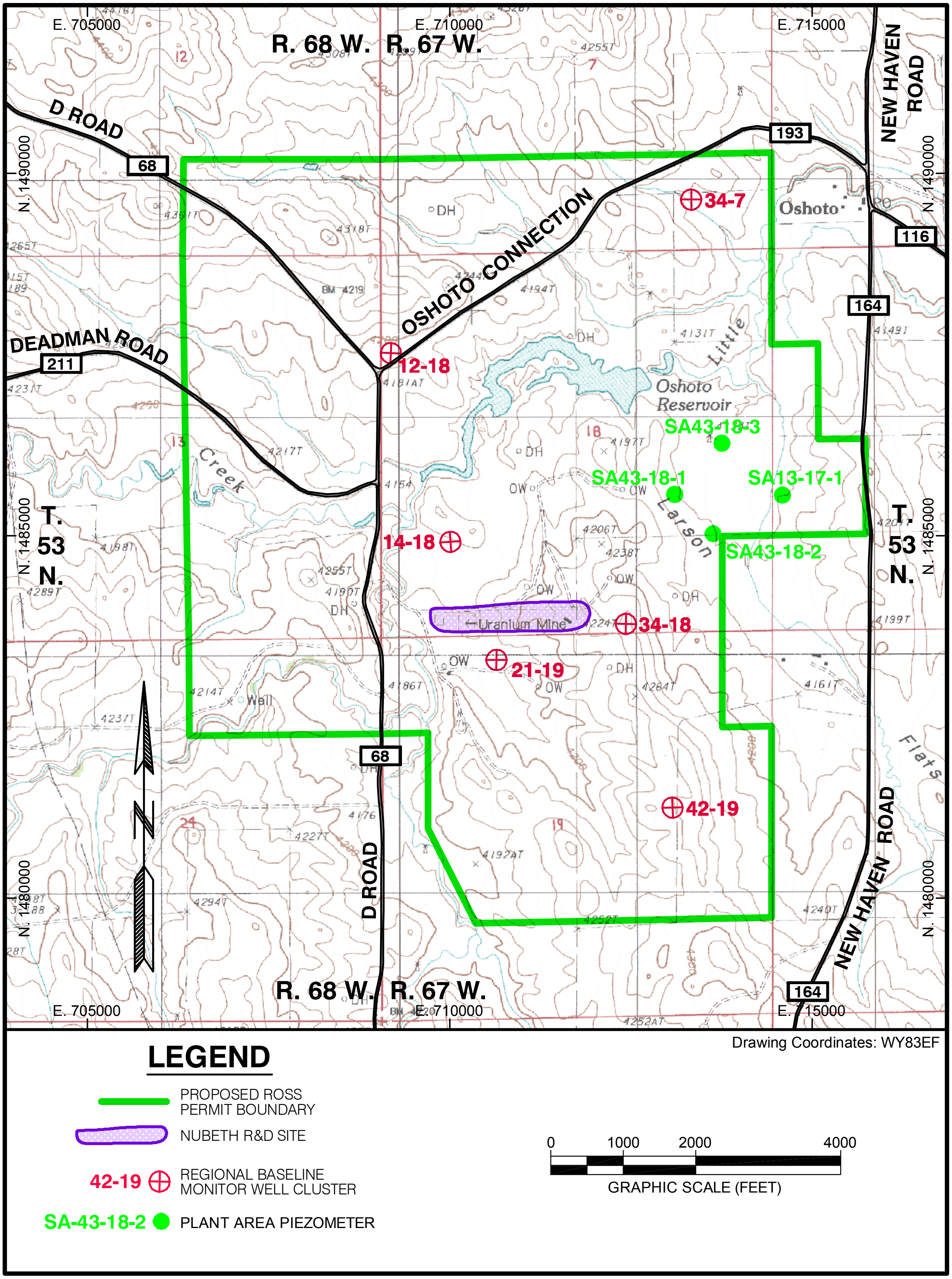

Figure 6. Regional Baseline Groundwater Monitoring Network

K:\Peninsula_Minerals\09142\DWGS_WY83E\ROSS_ER_HYD_BASELINE_MON.dwg, TRA_2.9-A_FIGURE_6, 12/20/2010 4:55:18 PM

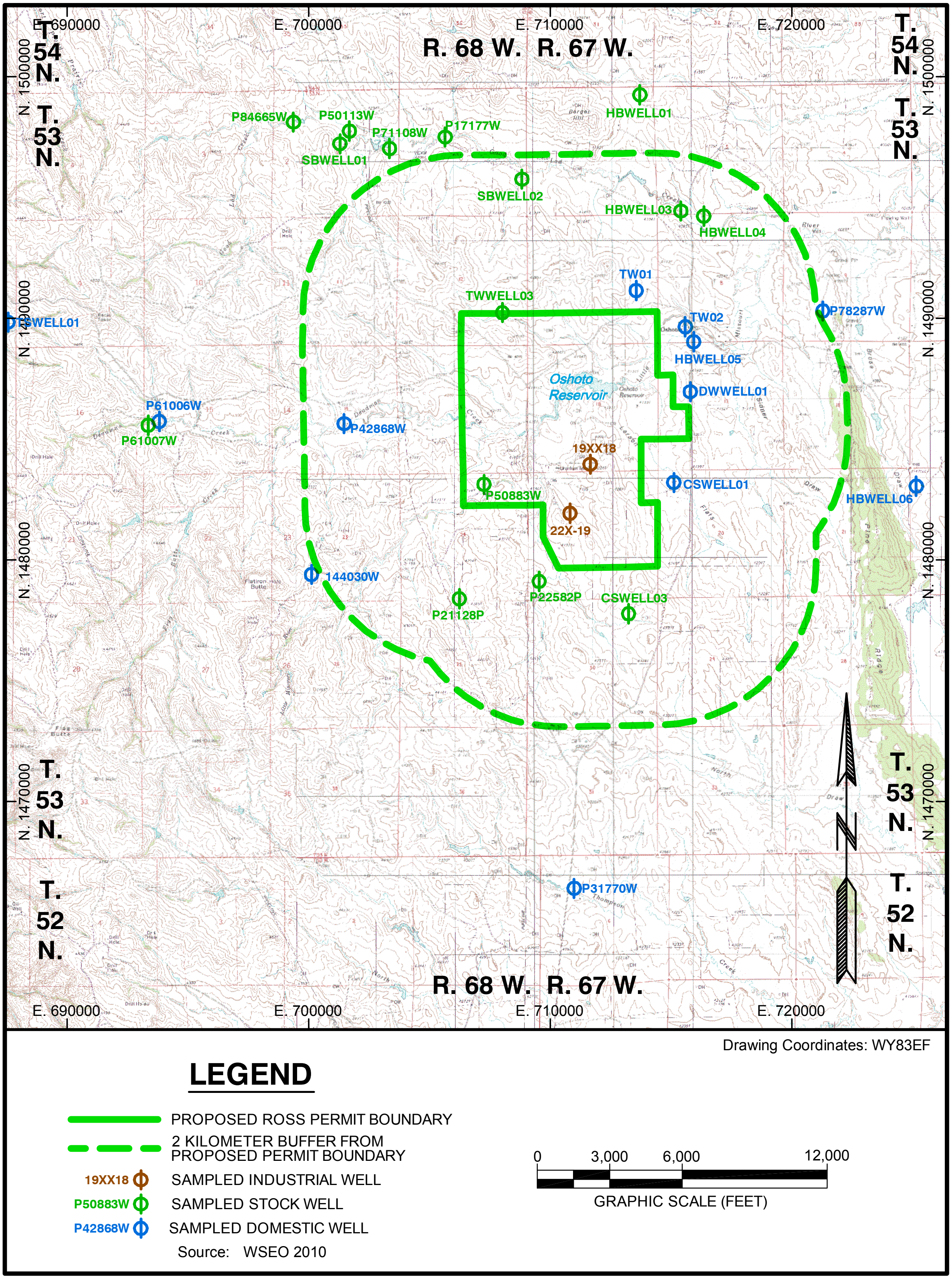

Figure 7. Sampled Water Supply Wells

K:\Peninsula_Minerals\09142\DWGS_WY83E\ROSS_ER_HYD_GW_WELLS.dwg, TRA_2.9-A_FIGURE_7, 12/21/2010 4:15:56 PM, dcjoh

3.10 ANIMAL TISSUE SAMPLING

NRC Regulatory Guide 4.14 recommends the sampling and analysis of the edible portions of livestock raised within 3 km of the site, as well as the sampling of wild game. It also requires the sampling of the edible portions of fish from all applicable bodies of water twice before construction.

3.10.1 Number and Location of Samples

Cattle are raised on and near the permit area for human consumption. As many of the cattle only live on or near the permit area for a small portion of their lives, meat samples will be collected from a cattle population that spends the largest portion of its life nearest the permit area prior to slaughter. The only other livestock raised on or near the permit area is horses. As horses are not raised for human consumption, they will not be sampled. There are several species of wild game that are hunted for meat regularly cross the property. These species include, but are not limited to: Whitetail Deer, Mule Deer, Pronghorn Antelope, Cottontail Rabbits, Sharptail Grouse, and Wild Turkey. Based on wildlife surveys conducted and resident hunting habits, meat samples will be collected from local hunters.

It is unlikely that any reservoirs on / near the site are large enough to support fish. The only water impoundment that will be sampled for potentially containing edible fish will be the Oshoto Reservoir. If any edible fish are caught in the sample process, they will be sent for analysis.

3.10.2 Sample Collection Methods and Frequency

Sample collection will be performed in accordance with SOP 10, Animal Tissue Sampling. Three edible tissue samples will be taken for each animal studied. Livestock will be sampled at the time of slaughter and wild game will be sampled during their specific hunting seasons. Attempted sampling of fish from the Oshoto Reservoir will occur twice prior to construction.

3.10.3 Analytical Program

Analytical requirements will be the same as for food crops and vegetation presented above. Please refer to section 3.9.3, Table 7.

4.0 QUALITY ASSURANCE

The following sections describe quality assurance and control procedures to ensure that all data gathered under this SAP is valid and defensible. The Standard Operating Procedures (SOPs) attached as Appendix A to this SAP provide the field guidance necessary to support this objective. Specific details of sample and data management program requirements to be applied to this project are described in SOPs # 12 and 13 respectively.

4.1 DATA QUALITY OBJECTIVES

The overall objective of this project is to establish radiological baseline conditions at the Ross project site. Data Quality Objectives (DQO) will be developed and used to accomplish the baseline radiological sampling activities such that the data acquired is valid and defensible. The DQOs established for this radiological baseline program include:

(1) Assessment of the quality of data generated to ensure that all data are scientifically valid and of known and documented quality. Quality assessment is largely accomplished by establishing acceptance limits for parameters such as precision, accuracy, completeness, representativeness, and comparability, and by testing generated data against acceptance criteria established for these parameters.

(2) Achievement of an acceptable level of confidence in the decisions that are made from data by controlling the degree of total error permitted in the data using quality control (QC) checks. Data that fail the QC checks or do not fall within the established acceptance criteria will be evaluated for usability in meeting project objectives during data review.

(3) Preparation and adherence to SOPs. Appendix A provides media-specific SOPs for field sampling and measurement, sample and data management, and equipment operation and calibration. Adherence to SOPs will ensure the consistency and thoroughness of data generation and meeting of DQOs. Additional detail on the DQOs for the Ross site radiological baseline program is provided in SOPs 12 and 13, *Sample Management* and *Data Management,* respectively.

4.2 PROJECT ORGANIZATION

Table 8 presents the personnel responsible for management and oversight of the radiological baseline monitoring program. The following sections describe staff responsibilities for pre-operational sampling and analysis.

Table 8. Project Organization

Project Role	Individual
Ross Project Manager	Tony Simpson, Strata
Consulting Project Manager	Ben Schiffer, WWC
Technical Project Manager/Senior Health Physicist	Steve Brown, CHP SENES
Project / Site Health & Safety Officer	Jeff Campbell, Strata Minerals
Field Managers/Lead Field Technician	Rod Fuller, WWC; Ronn Smith, IML; Jacob Mulinex, BKS

4.2.1 Strata Project Manager

The Strata Project Manager provides program goals, direction and guidance to the project team

4.2.2 Consulting Project Manager

The Consulting Project Manager is responsible for coordination of project activities and administrative management of the baseline radiological sampling and monitoring program. The Consulting Project Manager is responsible for ensuring that project staff understand and comply with quality assurance procedures discussed in this SAP and in the media-specific SOPs. The Consulting Project Manager also is responsible for managing project schedules, budgets, and deliverables, and for notifying the Strata Project Manager of any difficulties or deviations in implementation of the SAP.

4.2.3 Technical Project Manager/Senior Health Physicist

The Technical Project Manager is a Senior Health Physicist and is responsible for providing appropriate technical direction, support, and resources to implement the baseline radiological sampling and monitoring program. The Technical Project Manager is responsible for overseeing field activities, in the field or remotely, and for ensuring that all individuals involved with implementing field sampling are properly trained in the procedures outlined in the SOPs and in reviewing analytical results.

4.2.4 Health/Safety Officer

The Site Health and Safety Officer are responsible for ensuring compliance with radiation safety requirements during all sampling operations. He/she will provide appropriate health and safety training for the sampling technician(s) as required.

4.2.5 Field Technicians

The Field Technicians will implement sample collection, handling, storage, and shipping activities among others. They will maintain the field sampling logs and notebooks and will be responsible for properly labeling sample containers. They also will obtain the required safety training and read and understand the health and safety and quality assurance plans. All field technicians will report to Technical Project Manager. It is the responsibility of field staff to notify the Technical and Consulting Project Managers of any difficulties or deviations in implementation of the SAP.

Field personnel will review and verify 100 percent of the data generated in the field. The Field Manager will be responsible for ensuring field and laboratory data is validated and verified in accordance with SOPs 12 and 13, *Sample Management* and *Data Management,* respectively.

4.3 FIELD SAMPLING PROCEDURES

Specific field sampling procedures for the program elements presented in this SAP are described in the SOPs which are provided in Appendix A.

4.4 ANALYTICAL METHODS AND PROCEDURES

Analytical services will be contracted to a qualified laboratory, e.g. *Intermountain Laboratories of Sheridan, Wyoming*. The contract laboratory will perform soil, water, radon canister charcoal, and sediment analyses. Analyses conducted by the contract laboratory will be completed in accordance with the laboratory's Quality Assurance Program Plan (QAPP). The laboratory QAPP will be appended to this SAP when the laboratory is selected. The contract laboratory will provide laboratory analytical and measurement procedures to the project Senior Health Physicist for review.

Analytical methods and reporting limits for radionuclides of interest are provided in the respective Tables # 2 thru 7 in each of the media specific subsections of Section 3.0. As applicable instructions for sample holding times and preservation requirements are contained within the media-specific SOPs. Certified, commercially clean sample containers will be obtained from the contract laboratory. If appropriate, the bottles will be labeled by the laboratory to indicate the type of sample to be collected. Required preservatives will be added to the bottles by the contract laboratory for aqueous analyses in the field.

As necessary (typically only for animal tissue), samples will be stored on ice in an insulated cooler immediately following sample collection to maintain a temperature of less than or equal to 6ºC. In general, samples collected for radiological analyses do not require storage on ice since the temperature does not impact the radionuclide concentrations. However, food and vegetation samples may need to be dried immediately after collection or stored in such a way as to prevent spoilage (to be determined by contract laboratory). Soil and sediment samples do not require additional preservation. As noted above, sample containers and the appropriate preservatives for aqueous samples will be obtained from the contract laboratory...

The holding time is specified as the maximum allowable time between sample collection and analysis and/or extraction, based on the analyte of interest, stability factors, and preservation methods. Samples will be sent to the laboratory after collection in sufficient time to allow the laboratory to meet holding time requirements.

Samples will be prepared for analyses in accordance with SOP 12, *Sample Management* which references methods contained in, e.g., EPA methodology as defined in *Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020* or *Standard Methods for the Examination of Water and Wastewater, 20th Edition, EPA SW-846*, and *40 Code of Federal Regulations (CFR) 136*. Sample preparation requests will be noted on the chain of custody form.

The contract laboratory will be responsible for reviewing and validating data generated at the laboratory.

5.0 REFERENCES

American National Standards Institute, ANSI/HPS N13.11- 2001, Personnel Dosimetry Performance- Criteria for Testing; US Nuclear regulatory Commission, National Voluntary Laboratory Accreditation Program (NVLAP), 15 USC 285; US Department of Energy, DOE Laboratory Accreditation Program (DOELAP), DOE / EH – 0027, Department Of Energy Standard For The Performance Testing Of Personnel Dosimetry Systems, 1986

Oak Ridge Associated Universities. NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination", J D Berger, 1992

U.S. Environmental Protection Agency "Manual for Chemical Analysis of Water and Wastes" EPA-625-/6-74-003a, 1974

U.S. Environmental Protection Agency "Standard Methods for the Examination of Water and Wastewater, EPA SW -846, Rev 6, 2007

United States Nuclear Regulatory Commission NUREG 1575, "Multi Agency Radiological Site Survey and Investigation Manual" (MARSSIM), 2000

United States Nuclear Regulatory Commission. Regulatory Guide 4.14, "Radiological Effluent and Environmental Monitoring at Uranium Mills," 1980

United States Nuclear Regulatory Commission NUREG 1910, "Generic Environmental Impact Statement for In Situ Leach Uranium Milling Facilities", US Nuclear Regulatory Commission, 2009

United States Nuclear Regulatory Commission NUREG 1569, "Standard Review Plan for In Situ Leach Uranium Recovery License Applications", 2003

STANDARD OPERATING PROCEDURE NO. 1
MONITORING FOR RADON IN AIR

Ross Uranium ISR Project
Crook County, Wyoming

Version 0

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

TABLE OF CONTENTS

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) provides guidance on the monitoring of ambient Rn-222 (radon) for the Ross ISR Radiological Baseline and Operational Monitoring Program. This SOP describes the equipment, precautions, field procedures, record keeping, and quality assurance/quality control (QA/QC) protocols to be employed when deploying and collecting the radon monitors. The purpose of this SOP is to measure the natural background concentration of radon in air at selected locations at the project site for purposes of establishing baseline conditions prior to operations and for assessing potential operational impacts from the release of radon at a later time.

The locations and sampling schedule for the monitoring program are described in the SAP. The radon monitors will be placed at the same locations as the TLDs (see SOP 02)

2.0 SUMMARY OF METHOD

3.0 SAFETY

The following precautions should be taken when implementing this SOP in the field:

- The equipment list should be checked prior to leaving office for the field to ensure that the required number of radon monitors and associated equipment (Section 8.0) are available. This is especially critical for the first installation of the protective housings and deployment of the monitors.

- Snakes, poisonous plants, and insects may be present at the radon monitoring stations. The technician must take care in deploying the monitors to follow the Health and Safety Plan in regard to avoiding biological hazards.

4.0 INTERFERENCES

The radon monitors must remain in the sealed film-foil bags until ready to install into the protective housing at each location. This is very important. The seals of each film-foil package should be carefully inspected prior to deployment to the field or opening to insure that the integrity of the seal has not been compromised.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the Radon in Air monitoring program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing Radon in Air monitoring are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the Radon in Air monitoring program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment must be available as necessary for monitoring start-up and quarterly change-outs:

- Radon monitors in sealed film-foil bags
- Metallic labels to seal each monitor upon retrieval (provided by radon monitor supplier)
- Plastic zip-lock bags to collect/store detectors during quarterly change outs
- Protective housing for each monitor being deployed (placed in field at initial installation)
- Hammer, screws, nails for fastening the protective housing at each monitoring

location
- Appropriate posts to which the protective housings will be attached (e.g., metal fence posts or heavy-duty wooden stakes that can be securely anchored into the ground and be at the appropriate height)
- Field log book
- Detector Log Sheets (provided by the monitor supplier)
- GPS unit to determine and record location coordinates in field log book (during initial installation only)
- Flexible screen or nylon mesh material to cover bottom of housing as needed to retain and prevent loss of detector should the Velcro fastener fail
- Duct tape and/or packaging tape to secure retaining screen at bottom of housing
- Personal protective equipment designated for the site (e.g., specific footwear, gloves, first aid kit, etc.)

7.0 PROCEDURE

The following sections describe the procedures that should be followed when implementing the Monitoring for Radon in Air SOP.

7.1 Pre-deployment

Prior to emplacing the radon monitors, follow the procedures described below.

- Keep the radon monitors in the sealed film-foil bags until ready to install into the protective housings at each location. This is very important. Carefully inspect the integrity of the film-foil packaging seals before deployment to the field. If the seal is compromised, contact the vendor for an immediate replacement. Before opening the film-foil packages in the field, re-check the integrity of the seals and the packages in general. If at this point an air-tight condition of the package is believed to be compromised, detail in the field log book the batch number on the package, individual detector ID numbers involved and contact Landauer so a replacement can be sent.

- Store the metallic labels in a safe place – these will be needed during monitor retrieval.

- Obtain proper supplies to fasten the protective housings at the monitoring locations – see equipment list in Section 8.0 above.

7.2 Radon Monitor Placement

The placement of the radon monitor at each location should be completed as described below:

1. If possible, grease any moving metallic components of the fastener system (e.g. screws, bolts, etc.) of the protective housing used to secure the radon monitor into the housing. This will help to prevent rust formation and facilitate station maintenance and/or quarterly detector change outs.

2. Attach the protective housing (using a metal bracket or hose clamps, if possible) to an appropriate mounting post (not to a building or similar structure).

3. Open the sealed film-foil bag and ensure the radon monitor is securely fastened to the bottom of the clear plastic cup (e.g., Velcro)

4. Remove the clear acrylic retaining ring from the protective housing by removing the wing nuts. Install the assembled cup inside the protective housing and replace the retaining ring and wing nuts in order to hold the cup in place (opening of the cup facing down). Cover the bottom opening with a flexible wire or nylon screen and secure with duct tape (but don't cover the cup opening with tape !) to prevent loss of the detector should the Velcro fastener fail during the quarter.

5. Mark on the detector label the station ID number and date deployed in the provided spaces on the detector label.

6. Fill in the field log book and detector log sheet with the serial number on the monitor label, date and time installed and the location information in the location/comments area.

7.3 Radon Monitor Retrieval

Prior to retrieving the radon monitors, verify that the metallic labels are packed with the items going to field for retrieval activities. The retrieval of the radon monitors at each location should be completed as described below:

1. Remove the cup from the protective housing by removing the flexible retaining screen and the clear acrylic retaining ring.

2. Remove the radon monitor from the plastic cup (i.e., separate the Velcro between the radon monitor and the plastic cup).

3. Attach the metallic label to the monitor by covering the filtered openings. It is important to verify that the metallic label is placed over the filtered openings on each of the radon monitors as soon as it is removed from the plastic cup, in order to stop the exposure to radon.

4. Mark on the detector label the date removed in the provided spaces on the detector label

5. Place radon monitor in a plastic bag and seal (e.g., Ziploc bag)

6. Label plastic bag with serial number on monitor label, monitoring location id, and date and time installed and retrieved.

7. Record the date on the detector log sheet. Make notes of any unusual conditions of the monitors, including any comments or observations about the general condition of the equipment at time of change outs (e.g. the general condition of the station and monitoring device, including any apparent damage or intrusion of moisture on or near the monitoring device).

Deploy the monitors for the next quarter using steps 3 through 6 from radon monitor placement Section 6.2.

7.4 Return to Monitor Supplier

Return all radon monitors and the detector log sheet to the monitor supplier for analysis. Copies of all forms should be retained with the field notes.

8.0 DATA AND RECORDS MANAGEMENT

All records and documentation associated with the radon in air monitoring shall be retained by WWC Engineering in accordance with its Quality Assurance Plan and regulatory requirements.

8.1 Field Log Book

All information pertinent to field monitoring must be recorded in a log book, regardless of the type of monitoring. The field log book should be a weather-resistant bound book designed specifically for field use, preferably with consecutively numbered pages. A log entry shall contain, at a minimum, the following information:

- The monitor identification number
- Location of monitor (GPS coordinates if possible)
- Name of monitoring technician

- Date and time of monitoring
- General notes on the condition of the monitors, housings, stations, integrity of film-foil packaging, etc.
- Other field observations

Monitoring situations vary widely, so no general rule can be given for the amount of information required. The best guideline is to record sufficient information so that the monitoring event could be reconstructed if necessary without relying on the sampling technician’s memory. The completed field log book(s) should be maintained and filed chronologically or as specified in the WWC Engineering Quality Assurance Plan.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

10.0 REFERENCES

STANDARD OPERATING PROCEDURE NO. 2
ENVIRONMENTAL GAMMA MONITORING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

Table of Contents

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) provides instruction regarding the field placement and collection of environmental gamma dosimeters to establish ambient baseline external radiation dose rates at the Ross ISR uranium recovery project in Crook County, Wyoming. This Standard Operating Procedure (SOP) describes the responsibilities, precautions, equipment and materials, field procedures, quality assurance/quality control (QA/QC) protocols and documentation requirements to be employed when executing this SOP.

Locations will be co-located with radon in air sampling stations (see SOP 01, *Monitoring for Radon in Air*). The sampling locations will be selected by experts, based on such variables as meteorological data, proposed well field and uranium extraction facility locations, proposed facility boundary (fence line), nearest permanent residents and local background.

2.0 SUMMARY OF METHOD

This SOP addresses the use of environmental dosimeters for determining average direct radiation (gamma) dose rates over extended time periods. The dosimeters are supplied by a vendor and exchanged on a quarterly basis (typically about 90-day monitoring periods).

3.0 SAFETY

The following precautions should be taken when placing dosimeters in the field:

- Hands should be cleaned prior to handling dosimeters to ensure that dosimeter packets are not contaminated.
- The emplacement schedule, dosimeter location maps and equipment list should be checked prior to leaving camp to emplace and/or exchange dosimeters to ensure that all required locations are visited and necessary equipment is available for emplacement / exchange.
- Snakes, poisonous plants, and insects may be present at the radon monitoring and other deployment stations. The technician must take care in deploying the monitors to follow the Health and Safety Plan in regard to avoiding biological hazards.

4.0 INTERFERENCES

Hands should be cleaned prior to handling dosimeters to ensure that dosimeter packets are not contaminated.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the Radon in Air monitoring program
- Ensuring the oversight of all monitoring activities
- Reviewing field activities and associated documentation to ensure that all activities are in compliance with applicable HASP, SAP and this SOP
- Ensuring that all individuals involved with implementing Radon in Air monitoring are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the environmental gamma dosimetry monitoring program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Adhering to all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. dosimeter chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment and materials must be in possession of the field technicians when executing this SOP:

- Water resistant ink pen
- Stakes (metal fence posts or heavy-duty weather resistant wood) – even after initial dosimeter emplacement, assume some could need to be replaced
- Fence post / stake driver, hammers, small nails, wire and duct tape
- Shovel and hand trowel
- Standard hand tools – pliers, screwdriver, wire cutters, knife, etc
- Field gloves
- Environmental Dosimeters
- Chain-of-Custody forms
- Field log book

7.0 PROCEDURE

The following sections describe the procedures that should be followed when emplacing environmental dosimeters.

7.1 Initial Emplacement of Environmental Dosimeters

The following procedures should be followed during initial emplacement of environmental dosimeters:

- Prior to leaving the office, review dosimetry station location maps and determine the most efficient route to visit each dosimeter emplacement location in consideration of travel time. distance and safety (terrain issues e.g.)
- Prior to leaving office, check to see that all equipment and materials are in hand per section 5 above
- When arriving at a designated location, document GPS coordinates and dosimeter # assigned to that location # on the chain of custody form and in the field logbook
- Drive stake into ground at least 0.25 meters and mound at base to enhance permanency (the stake or fence post for the radon in air station can also serve as the mounting structure for the dosimeter station)
- Secure dosimeter packet to stake, approximately 1 meter above the ground, using nails, wire and/or duct tape. Do not cover the dosimeter chip set itself with excessive wrapping of tape. Note dosimeter ID #, location # with GPS coordinates on chain of custody form and in log book.
- Proceed to next location and repeat this process
- After last dosimeter is emplaced, review location map and chain of custody form to ensure all environmental dosimeters have been emplaced at correct locations. Also note location sequence used in the logbook and any recommendations for revisions to the sequence based on lessons learned.

7.2 Quarterly Exchange of Environmental Dosimeters

The following procedures should be followed during the quarterly exchange of environmental dosimeters:

- Prior to leaving office, review location maps and determine the most efficient route to visit each dosimeter emplacement location in consideration of travel time, distance and safety (terrain issues e.g.). This route should have been determined during initial placement of dosimeters (see 6.1 above). However, note if suggestions for revision of location sequence has been previously noted in logbook.
- Prior to leaving office, check to see that all equipment and materials are in hand per section 5
- At each location, remove existing dosimeter packet from stake and inspect for damage, preservation of ID# on badge, etc – note condition and issues in log book and on chain of custody form – place exposed dosimeter in secure bag or container
- Secure new, “unexposed “ dosimeter packet to stake, approximately 1 meter above the ground using nails, wire and/or duct tape. Do not cover the TLD chip itself with excessive wrapping of tape.
- Note dosimeter ID #, location # and associated GPS coordinates on chain of custody form and in field log book.
- Proceed to next location and repeat process.
- When all dosimeters have been replaced, return collected units to office. Ensure that you have replaced and collected all previously exposed units and that the chain of custody form is complete.
- Retrieved dosimeters and copy of associated chain of custody form will be returned to vendor. It is the responsibility of the site manager to ensure field technicians have executed this program in accordance with this SOP
- The transit controls will be returned to the vendor in accordance with this SOP.

8.0 DATA AND RECORDS MANAGEMENT

The following sections describe documentation and record keeping procedures.

8.1 Field Log Book

All information pertinent to the placement and collection of environmental dosimeters must be recorded in the field logbook. The field logbook should be a weather resistant bound book specifically designed for field work, preferably with consecutively numbered pages. A log entry shall contain, at a minimum, the following information:

- The dosimeter identification number along with reference to either a field dosimeter or control dosimeter
- Location #, description and GPS coordinates (or statement of storage location in the case of control dosimeters)

- Name of field technician
- Date and time of placement / exchange
- Method of dosimeter emplacement (existing post or fence, new stake, wire, tape, etc)
- Weather conditions
- If dosimeter exchange, note condition of retrieved dosimeters by ID and location #

8.2 Chain of Custody Form

The Chain of Custody Form is included in this SOP as Attachment 1. Once completed, this form shall be maintained in accordance with the WWC Engineering Quality Assurance Plan.

8.3 Calculations

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

The purpose of environmental gamma monitoring is to determine the *total* ambient gamma radiation dose rate at a given location, averaged over the period of deployment in the field. In contrast, the purpose of occupational personal monitoring is to determine the average *above background* dose rate that the worker receives during the monitoring period. Therefore, handling of transit and deploy controls is of utmost importance in the environmental dosimetry measurement process. The transit control should record only the gamma dose that is incurred while the dosimeters are in transit from the vendor to the main office facility, plus the dose incurred during return transit back to the vendor. The deploy control, used primarily for QC assessments, will record the total dose incurred from the date of issuance by the vendor until returned to the vendor for analysis after completion of the field monitoring period. It is important that control badges are kept in a secure, dry location away from any heat sources or radioactive materials while at the office facility.

The dosimetry vendor should supply two control dosimeters with each shipment (a transit control and a deploy control). These are to be used for final field dose calculation and/or as QA/QC dosimeters. They are not placed in the field. The transit control is returned to the vendor immediately upon receipt of the badge shipment. It is used to determine exposure of the badges while in transit and to ensure that the shipment was not exposed to unusual levels of radiation during transit to the project site.

A reasonable assumption is made that the dose received by the transit control during travel to the project and back to the vendor for analysis is equivalent to the dose received by the actual field badges during travel to and from the project. The deployment control is stored in a secure, dry location in a relatively low-level background radiation environment as described earlier in this SOP during the quarterly field exposure periods, and returned to the vendor with the regular shipments of the field-deployed dosimeters.

The vendor will analyze the deploy control dosimeter concurrent with the field dosimeters to verify that the return shipment was not exposed to unusual levels of radiation and as a QA/QC check on the field dosimeter results.

The transit control dosimeter result will be used to calculate the total dose received by the field dosimeters during deployment at the field monitoring stations as described earlier in this SOP. The ID numbers for both control dosimeters (transit and deploy) and respective labeling as such must be explicitly recorded on the chain of custody forms and in the field logbook.

All records and documentation associated with dosimeter emplacement and collection, including the chain of custody form, shall be retained by WWC Engineering.

10.0 REFERENCES

American National Standards Institute (ANSI). 2001. *ANSI/HPS N13.11- 2001, Personnel Dosimetry Performance- Criteria for Testing.*

United States (U.S.) Nuclear regulatory Commission (NRC). 2001. National Voluntary Laboratory Accreditation Program (NVLAP), 15 Code of Federal Regulations Part 285.

DOE/EH-0027. 1986. “Department of Energy Standard for the Performance Testing of Personnel Dosimetry Systems.” U.S. Department of Energy Laboratory Accreditation Program (DOELAP).

STANDARD OPERATING PROCEDURE NO. 3
AIR PARTICULATE SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

TABLE OF CONTENTS

1.0 SCOPE AND APPLICABILITY

The purpose of this document is to define the standard operating procedure (SOP) to be followed for the collection of air sampling filters used to determine the concentrations of radionuclides in air as part of the Baseline Radiological Monitoring Program at the Ross ISR project, Crook County, Wyoming. Air particulate samples are collected using F & J Specialty Products Models DF -30L-BL-AC and LV-1D (see operating manuals for these devices attached herewith), which have been previously installed at permanent locations. A filter is collected from each air-sampling unit on approximately a weekly basis during a three-month quarter. The collected set of filters (typically about 13, one per week) for each air sampling unit is sent for contract laboratory analysis at the end of each quarter.

2.0 SUMMARY OF METHOD

The United States (U.S.) Nuclear Regulatory Commission's (NRC) Regulatory Guide 4.14 (*Radiological Effluent and Environmental Monitoring at Uranium Mills*) requires a year of preoperational data collection via continuously operating air samplers. Quarterly composites are to be analyzed for naturally occurring radionuclides as discussed below. Figure 1 presents the location of the Ross project air particulate samplers. Table 1 presents their GPS locations. The technical basis and rationale for selection of these locations, in accordance with the guidance presented in NRC Regulatory Guide 4.14, is described in the Ross project Sampling and Analysis Plan (SAP).

The requirement for weekly collection and replacement of air filters is flexible. Unsafe weather conditions are sufficient cause to delay filter replacement for a day or more. The principal driver for this SOP is that air sampling should be essentially continuous, allowing the contract laboratory to meet minimum detectable activity (MDA) requirements for specific radionuclides as specified in Regulatory Guide 4.1.4 and in accordance with the quality assurance requirements described in NRC Regulatory Guide 4.15 (*Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment*). This means that, if a specific filter exchange is delayed for a day or several days, the sampling record remains continuous and the MDA can be met, since one filter may represent eight or more days of sampling while the next may represent six or fewer days, but the collection of sample filters during any quarter still represents 13 weeks of essentially continuous air sample collection.

A warning in this context is necessary, although it is not expected to be an issue in rural NE Wyoming. In severely dusty conditions, the sampling filters could become plugged with dust after <u>fewer</u> than 7 days. This will be apparent since the air sampler flow rate will drop significantly from the normal 28-30 liters per minute (lpm at local temperature and pressure) if filter plugging occurs. A sampler flow rate less than about 25 lpm is evidence of such dust plugging. During a period (such as a severe dust storm) when such plugging is likely, filters should be exchanged more often than the normal weekly requirement, recognizing the overriding need for personnel safety during such an exchange. Experience will determine whether early filter exchanges may be necessitated by extremely dusty conditions. To gain this experience, following a dust storm the sampling units should be visited and the air sampler pump displays checked to determine whether the flow rate has been significantly reduced. If the flow rate is approaching the lower limit of 25 lpm, the filter should be exchanged (using this SOP).

Air sample filters will be analyzed by a contract laboratory for radiological constituents to determine airborne concentrations. Air samplers draw air and suspended particulate matter through the 47 millimeter (mm) collection filters at known volumetric flow rates for known periods of time. All respirable air particulate matter is assumed to be captured by the filters.

The filters are analyzed by a radiochemical laboratory to determine activity of each specified radionuclide (Ra-226, Th-230, Pb-210, Natural (total) Uranium and Gross Alpha). Laboratory-reported specific radionuclide activities for the composite filter set are divided by the total volume of air that passed through the air filters over the quarterly sampling period to determine the average air concentrations for each radionuclide for the period sampled at that specific sampling location.

3.0 SAFETY

The following precautions should be taken when working at the air particulate monitoring stations:

- Regularly survey the area surrounding the air sampler location to be sure it is free of snakes or other hazardous biota or poisonous plants. Pay particular attention to areas that are not clearly visible and avoid stepping in or placing hands in locations with potential hidden dangers.
- Watch out for loose rocks and unstable footing.
- Inspect air filter sample envelopes and ziplock bags for cleanliness prior to use. Such containers shall not be reused, nor shall they be used if there is any question as to their origin. If applicable, sample containers supplied by or recommended by the contract laboratory shall be used.
- Clean hands immediately prior to sample collection and wear latex or nitrile gloves to ensure that samples are not contaminated. Clean sample handling tweezers between uses.
- Latex gloves should be discarded after sample collection at each location and new gloves worn.
- Appropriate footwear, long trousers and snake chaps should be used as determined to be appropriate by the site manager.
- Operate and handle all equipment, filters, and other key items in accordance with manufacturer specifications.

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the air particulate monitoring program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the air particulate monitoring are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing vendor supplied data when received for completeness and accuracy and using this data to calculate results for the air particulate monitoring program and to ensure program technical objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment is required for air filter collection:

- Appropriate safety clothing and other safety gear
- Air filter containers (new air filter sample envelopes and new plastic ziplock bags)
- Permanent marking pen (Sharpie, e.g.)
- New air filters (47 mm Teflon filters, specified by contract laboratory)
- Tweezers (to grasp edge of filter without contacting sampling area)
- Field log book
- Disposable gloves
- Water and clean, soft cotton cloth.

7.0 PROCEDURE

The following sections describe the procedures that should be followed when implementing the Monitoring for Radon In Air SOP.

7.1 Air Sampler Operation

See F & J Specialty Products operating manuals for Models DF -30L-BL-AC and LV-1D provided as attachments to this procedure.

7.2 Sampling Filter Replacement

The following section describes how to properly replace air sample filters.

- Extract air sample filter holder using the quick disconnect under the protective hood that shields the filter holder; unscrew filter holder ring and, using tweezers, gently remove air filter without contacting either surface of the filter. Take care in a windy environment not to allow the filter to blow loose or particulate to fall off the filter.
- Place the removed filter inside a clean, protective Petri dish and close the Petri dish.
- Place the closed Petri dish into a clean, pink zip-lock bag and seal the bag.
- With the Sharpie pen, mark today's date, the air sampler location and the air sampler's ID number on the zip-lock bag.
- Note filter removal date, sampler location, sampler ID and other information as specified in this SOP in the field logbook.
- Clean the air sample filter holder using a soft cloth. Using the tweezers carefully install a new filter without touching either side of the sampling area. Hand-tighten the filter holder ring, keeping the filter centered properly.
- Reconnect the air sample filter holder to the quick disconnect under the protective hood.
- Record current conditions (time of day, weather, temperature, any unusual conditions) in the sampling log book.

7.3 Sample Handling

The following describes procedures for handling air filter samples.

- Weekly air filters collected from each air sampler should be stored together in a larger ziplock bag marked with that sampler's location and ID #.
- No special preservation measures are required during collection and storage of each quarter's (three months) of air filters. The ziplock bags holding each collection of filters should be stored securely in a locked cabinet to prevent tampering or loss.
- At the end of each quarter, each large ziplock bag, containing the 13 air filters in their envelopes inside the smaller ziplock bags, should be packaged and delivered as quickly as possible to the designated contract laboratory, accompanied by paperwork as required by the laboratory and specified herein. Of critical importance is that the large bags be properly marked and sealed, and shipped in strong, tight containers suitable for rough handling and long distance shipment, with complete instructions for contract laboratory processing, analysis and data reporting included.

8.0 DATA AND RECORDS MANAGEMENT

All information pertinent to field sampling must be recorded in a log book. The field log book should be a bound book, with consecutively numbered pages. A log entry shall contain at a minimum the following information:

- Air sampler identification number
- Purpose of sampling ("Radionuclide air concentration measurement.")
- Location of sampler
- Name of sampling technician
- Date and time of sampling
- Analyses to be performed

Sampling situations can vary. The best guideline is to record sufficient information such that the sampling event could be reconstructed if necessary, without relying on the sampling technician's memory. Completed field log book(s) shall be maintained and filed chronologically.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

10.0 REFERENCES

United States NRC Regulatory Guide 4.14*, Radiological Effluent and Environmental Monitoring at Uranium Mills, Revision 1.* 1980

United States NRC Regulatory Guide 4.15, *Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment.* 1979

STANDARD OPERATING PROCEDURE NO. 4
SURFACE SOIL AND SOIL PROFILE SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

The purpose of this standard operating procedure (SOP) is to describe the procedures for the collection of representative soil samples for establishing baseline concentrations of key radionuclides and chemical properties in surface soil and soil profiles. The baseline will help determine potential impacts from mining activities during operations or closure, as well as defining the baseline soil resource for purposes of salvage and replacement within the mining operation and ultimate reclamation. Section 3.5 of the Pre-Operational Sampling and Analysis Plan defines sampling locations and radiochemical analysis requirements for the preoperational baseline program.

Described herein are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the actual procedures used should be documented and described in the soil sampling program report.

2.0 SUMMARY OF METHOD

3.0 SAFETY

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the soil sampling program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the soil sampling are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations

- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing field and laboratory data when received for completeness and accuracy and using this data to report results for the soil sampling program and to ensure program technical objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

Equipment that may be used during surface soil and soil profile collection:

- Pickup-mounted Giddings soil sampler
- Gallon-size (at minimum) plastic bags that will be tied near the top of the bag
- Spade for surface samples, if needed
- Stainless steel soil splitter for homogenizing and dividing soil, if needed
- Decontamination equipment and supplies as per appropriate sections of SOP No. 11
- Stainless steel buckets
- Stainless steel hand auger
- Tape measure
- GPS unit
- Bound field logbook
- Labels and appropriate field sheets
- Sampling site location maps
- Field sampling data sheets (Figure 1)
- Digital camera

- Appropriate health and safety equipment, as specified in the Health and Safety Plan

7.0 PROCEDURE

Sampling staff should first carry out procedures listed in sections 9.1, Preparation, and 9.2, General Soil Sampling Procedures at all locations. Procedures for samples should then be carried out based on the location's classification as a radiological surface sample, radiological soil profile, or agronomic soil profile.

7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required. Obtain necessary sampling and monitoring equipment.
2. Decontaminate or pre-clean equipment, and ensure that it is in working order in accordance with SOP 11, Decontamination.
3. Prepare schedules and coordinate with staff, SENES Consultants, and WWC Engineering, if appropriate. Clear all dates and times of field work at least one week in advance:
    a. Jeff Campbell, Strata Energy (307)467-5995
    b. Ben Schiffer, WWC Engineering (307) 672-0761 ext. 148 (if Jeff Campbell cannot be reached)
4. Perform a general site survey prior to site entry noting general site conditions (weather, topographical features, etc) in accordance with the project Health and Safety Plan.
5. Specific site factors should be considered when selecting the exact sample location.
6. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.
7. Sample locations should be utility-cleared, if necessary, prior to soil sampling, based on hazards of utility disruption to personnel and stakeholders.

7.2 General Soil Sampling Procedure

1. Clean and prepare the sample equipment sampler in accordance with the appropriate procedure in SOP 10. At a minimum, loose soil material will be removed from equipment by wire brushing or other suitable means between sampling locations and depths.
2. Field locate each sample using a hand held recreational grade GPS, documenting the location.
3. Clear grass, rocks, sticks, etc. to the extent possible prior to collecting sample.
4. General sampling conditions, including weather conditions, should be noted in bound field logbook.
5. Samples should be kept as cool and dry as practically possible. It is not required that samples be stored on ice.

7.3 Radiological Surface Soil Sample Collection

Collection of samples from surface soil can be accomplished with tools such as Giddings, spades and/or shovels.

1. Using appropriate hand tools, obtain soil samples at each location from a depth of 0-15 cm.
2. A sample size of 200 grams is required.. If the sampling attempt encounters the base of C-horizon prior to achieving the 15 cm depth, it should be noted in the field log. A minimum of 200 grams must still be collected; if the total depth at a given location does not provide that volume, the sample will be relocated.
3. Do not composite any samples.
4. Place the collected soil material in plastic bags or other suitable containers, labeled with project, sample ID #, depth, and date of collection.
5. Make an entry for the sample on the Soil Mapping Verification Form, Figure 1.

Complete a chain of custody form and handle samples as directed :generally as soon as possible, samples should not be held longer than 10 days before transfer to the laboratory.

7.4 Radiological Soil Profile Sample Collection

1. Begin digging or augering, periodically removing and depositing accumulated soils onto a halved PVC tube located near the hole. This prevents accidental brushing of loose material back down the borehole when removing the auger, and avoids possible contamination of the surrounding area.
2. After reaching the depths of 30, 60, and 100 cm, slowly and carefully remove the material from the boring. Remove any soil by hand, if possible, that falls back into the borehole as the auger is removed. Soils from each depth are to be separated for individual analysis.
3. A minimum of 200 grams must still be collected from each depth; if the total depth at a given location does not provide that volume, the sample will be relocated.
4. Do not composite any samples.
5. Place collected soil material in plastic bags or other suitable containers, labeled with project, sample ID #, depth, and date of collection.
6. Make an entry for each sample on the Soil Mapping Verification Form, Figure 1
7. Complete a chain of custody form and handle samples as directed: generally as soon as possible, samples should not be held longer than 10 days before transfer to the laboratory.

7.5 Agronomic Soil Sample Collection

The total number of agronomic sample locations will depend on acreage of the proposed disturbed or mined area (roads, facilities and well fields) as described in WDEQ-LQD Guideline 1.

1. Using a Giddings pickup mounted auger, sample to paralithic contact or a maximum depth of 60 inches, whichever is shallower
2. Subsample surface soil horizons (topsoil and subsoil) by collecting sufficient sample for agonomic analysis to provide comparative data for the specified soil interval.
3. Describe each sample profile, to the extent possible, by the physical and chemical nature of each profile horizon
4. Place a minimum of one liter of homogenized soil from each sample depth in a clean properly labeled plastic bag for shipment to the laboratory. Ensure there is sufficient space at the top of the bag to be tied or taped shut for security. Place additional sample of surface soils in plastic bag for agronomic analysis, if necessary for analytical volume, place in a shipping container and label.
5. Compile a soil pedon description for each soil sample location.
6. Label and handle the sample containers in accordance with SOP No. 12.0, Sample Management.
7. Make an entry for each sample on the Soil Mapping Verification Form, Figure 1
8. Complete a chain of custody form and handle samples as soon as possible to the laboratory, store for future analysis, etc.)

8.0 DATA AND RECORDS MANAGEMENT

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

10.0 REFERENCES

This procedure will be implemented per applicable guidance provided in the following:

- NUREG 1575, “Multi Agency Radiological Site Survey and Investigation Manual” (MARSSIM), 2000; Section 7.5.1, Surface Soil Sampling
- NRC Regulatory Guide 4.14, “ Radiological Effluent and Environmental Monitoring at Uranium Mills,” 1980; Table 1
- ASTM C 998-90, “Standard Practice for sampling Surface Soil for Radionuclides”
- ASTM Designation: C 998 – 90, Standard Practice for Sampling Surface Soil for Radioactivity, 2000
- WDEQ- Land Quality Division, Guideline 1, "Topsoil and Overburden." 1994

In addition, soil sampling personnel should also be familiar with the following Standard Operating Procedures for the Ross ISR project:

- SOP 11, Decontamination of Sampling Equipment
- SOP 12, Sample Management

STANDARD OPERATING PROCEDURE NO. 5
SEDIMENT SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) is applicable to the collection of representative sediment samples. Analysis of sediment will be used for establishing baseline concentrations of key radionuclides and chemical properties in surface soil and soil profiles.

The methodologies discussed in this procedure are applicable to the sampling of sediment in both flowing and standing water. This procedure is generic in nature and may be modified in whole or part to meet the constraints presented by the sampling location. However, if modification, they should be documented on the field sampling form.

Samples should be collected from surface water sites and impoundments identified in Section X.X of the SAP and Section X.X of the Ross ISR Preoperational Baseline Monitoring Plan.

2.0 SUMMARY OF METHOD

Sediment samples are collected from surface water and water bodies within and/or potentially affected by operations related to the recovery of uranium. The baseline samples will provide a basis for assessing the environmental impacts of uranium mining activities, as well as define the baseline soil resource for purposes of salvage and replacement within the mining operation and ultimate reclamation.

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.
- Follow the procedures outlined in the Health and Safety Plan

4.0 INTERFERENCES

Care should be taken during sample collection to ensure that foreign materials do not contaminate the samples.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the sediment sampling program

- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the sediment sampling are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing field and laboratory data when received for completeness and accuracy and using this data to report results for the sediment sampling program and to ensure program technical objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following is a list of equipment that may be used during sediment sampling:

- Gallon-size (at minimum) plastic bags that will be tied near the top of the bag or sealable plastic containers for sample collection
- Trowel/scoop for obtaining samples
- Tape measure
- GPS unit
- Labels
- Sampling site location maps
- Field sampling data sheets for sediment samples (See SOP 12 for guidance)
- Chain of Custody forms (See SOP 12 for guidance)
- Digital camera
- Appropriate health and safety equipment, as specified in the Health and Safety Plan

7.0 PROCEDURE

The sediment sampling program should be carried out concurrently with the surface water sampling program.

7.1 General Sampling Procedures

The following procedures should be carried out for all sediment samples:

1. Decontaminate or pre-clean equipment in accordance with SOP 11, Decontamination, and ensure that it is in working order.
2. Prepare schedules and coordinate with staff, SENES Consultants, and WWC Engineering if appropriate. Clear all dates and times of field work at least one week in advance:
   Jeff Campbell, Strata Energy (307)467-5995
   Ben Schiffer, WWC Engineering (307) 672-0761 ext. 148 (if Jeff Campbell cannot be reached)
3. Perform a general site survey prior to site entry noting general site conditions (weather, topographical features, etc) in accordance with the project Health and Safety Plan.
4. Specific site factors should be considered when selecting the exact sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.
5. Sampling locations should be located with sampling maps. The specific location chosen for each site should be recorded using coordinates from a hand held GPS device.

7.2 Sampling Procedure for Water Impoundments

1. Collect approximately two cups (0.5 liters) of material from the sediment layer at each sample point by hand or with a scoop. Avoid collecting layers that are composed of decaying biological matter that has a foul smell.
2. Place sample in an appropriately marked contained.
3. Keep samples as cool and dry as possible in the field.

7.3 Sampling Procedure for Ephemeral Streams

1. After major storm events, storm water collection devices located in the ephemeral streams will be inspected for significant storm water and sediment collection. Inspections will be carried out after weather and running water conditions have become safe and in accordance with the project health and safety manual.
2. If sediment has settled out in the sample, pour most of the water off into a separate container for anaylsis. If the majority of the sediment is still in suspension in the water, leave the collection container in a flat, fairly cool,

location until sediment has settled. Pour off water after this for separate analysis.

8.0 DATA AND RECORDS MANAGEMENT

Follow procedures described in SOP 13.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

Follow procedures described in Section 5.3 of SOP 12.

10.0 REFERENCES

The following Standard Operating Procedures should be read and followed, when applicable, in the implementation of this SOP.

- SOP 11, Decontamination of Sampling Equipment
- SOP 12, Sample Management
- SOP 13, Data Management

STANDARD OPERATING PROCEDURE NO. 6
FOOD CROP AND VEGETATION SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) is applicable to the collection of representative food crop and vegetation samples. The methodologies discussed in this procedure are applicable to the sampling grasses, forbs, and shrubs. This procedure is generic in nature and may be modified in whole or part to meet the constraints presented by the sampling location. However, if modification, they should be documented on the field sampling form.

2.0 SUMMARY OF METHOD

Vegetation samples are collected from various locations within and near the site boundary at various times during the growing season, as well as prior to animal slaughter and/or hunting season. The baseline samples will provide a basis for assessing the environmental impacts of uranium mining.

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.
- Follow the procedures outlined in the Health and Safety Plan

4.0 INTERFERENCES

Care should be taken during sample collection to ensure that foreign materials do not contaminate the samples.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the food crop and vegetation sampling program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the food crop and vegetation sampling are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing field and laboratory data when received for completeness and accuracy and using this data to report results for the food crop and vegetation sampling program and to ensure program technical objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment and materials may be used during plant sample collection:

- Stainless steel pruning sheers, grass sheers, shovel, trowel, knife
- Sample bags (plastic re-closeable bags)
- Sample collection supplies- waterproof markers, sample labels, chain of custody forms, clear plastic and strapping tape, custody seals, trash bags (See SOP 12 for guidance)
- Data collection supplies (See SOP 12 for guidance)
- Field Balance

Other equipment and supplies may be needed based on site conditions:

- Measuring tapes
- Disposable sampling gloves
- Digital Camera
- Topographic maps or aerial photos
- Fs23 Plant identification guides
- GPS unit

7.0 PROCEDURE

7.1 Time of Sampling

Terrestrial vegetation samples will be collected during the growing season when plant material produced during the current year is available. Cool season grasses will be sampled in late May or June. Shrubs, warm season grasses and forbs will be assessed to determine whether there is sufficient new growth to warrant sampling at that time, or whether a second sample collection trip is warranted. If there is insufficient new growth available, remaining samples will be collected between the middle of August and middle of September. There will be not collection of aquatic plants during this project.

7.2 Selection of Species

A field reconnaissance will be used to assess species presence and abundance and to select general areas for plant sampling for each area. A list of species will be recorded that are at least locally common in the areas of interest. Potential sampling areas for various species will be marked on a map or aerial photograph.

A field reconnaissance of potential reference areas will then be completed and the reference area selection criteria documented. Potential sampling areas for various species will be marked on a map or aerial photograph to assist in selection of areas. Final selection of areas will be based on presence of suitable species, reference area criteria, accessibility, and presence of more than one sample species.

The plant species to be sampled will be based in part on species known to be present in the area. In addition, plants should be of approximately the same size and phenology. Foliage samples will be collected from cool-season grass species, warm-season grass species, forb species and shrub species, and fruit or seed samples will be collected from the shrub species when present as determined by the field season. A different species of the same life form will be substituted when a proposed species is not present or not sufficiently abundant in both the areas of interest and reference areas. Substitute species will be used only if one of the primary or supplemental vegetation species is sufficiently abundant in both the areas of concern and a potential reference area. Sample sites locations will be documented with a GPS field unit, and the coordinates downloaded into a CAD map of the site area.

7.3 Sample Collection

Each vegetation tissue sample will be a composite of material from at least 5 individual plants of the same species/tissue type. Individual plants should be randomly selected using a transect or radial plot, and should be located at least 1-3 meters apart, depending on size. Individual plants that are atypical for the sample site based on size, vigor, pathology or herbivory should not be included. Atypical means that less than 5% of the plants are similar. An approximately equal amount of vegetation will be collected from each individual plant. For rhizomatous species such as *Pascopyrum smithii* (western wheatgrass) and *Artemisia ludoviciana* (Louisiana sagewort), an individual will be considered to consist of aboveground plant parts connected by rhizomes or other roots.

Vegetation samples will be clipped using pruning shears or grass shears, as appropriate, and wearing clean disposable gloves. Cutting equipment will be decontaminated between each sample in accordance with SOP 11. Smaller plants such as forbs may be collected in their entirety, while larger plants will be clipped on at least two sides. Foliage, fruit and root sampling procedures for the various life forms are described below.

Ideally, each sample will be composed of 2-4 kilograms of fresh biomass for radioanlytical analysis, however this is an incredibly large sample for most plant species so a large of a sample as is reasonable should be taken, ensuring at minimum 300-400 grams of fresh biomass. Each composite sample should be weighed in the field to ensure that an adequate quantity has been collected. Plant material for washed and unwashed samples will be collected from the same plants at the same time, and will be split into two sample bags as it is clipped. Washing of plant samples if needed will be completed at the lab. Vegetation samples will be placed in re-sealable plastic bags, and will be double bagged. Sharp points on woody vegetation will be bent or broken off within the bag so that the bags are not punctured. Bags will be appropriately labeled and recorded, and placed in a cooler on ice until shipped to the laboratory. Field data will be recorded, as described under Section 6.0 Observations.

Grass foliage samples will be collected using a grass shears. Clipping height will be approximately 0.5 to 2 inches above ground level, and will be adjusted as needed to maximize collection of green and mature vegetation from the current growing season, and to minimize collection of standing dead plant material from previous years. If collection of dead material from previous years is unavoidable, larger pieces will be removed by hand so that the sample consists primarily of new growth. Grass foliage samples will include leaves, stems, and inflorescences as present on the plants. All material above the cutting height will be collected.

Forb foliage samples will be collected using pruning shears or grass shears as appropriate, and will be clipped at ground level. Forb foliage samples will include leaves, stems and inflorescences produced during the current season, as present above the clipping level. Attached dead material from previous years should be removed by hand as practicable.

Shrub foliage samples will be collected using a pruning shears. Collected material will include growth from the current season, including both twigs and leaves, but excluding fruits or flowers. Shrubs should be clipped at a height of between 0.5 to 1.5 m height, on four sides.

Fruit, nut, or seed samples will be collected when they are present in sufficient quantity on the shrub species sampled for foliage and roots, and where they have moderate or high value for wildlife. Fruits, nuts and or seeds will be clipped or hand collected and placed into individual sample containers.

Modifications to these procedures may be made in the field as appropriate, based on the professional judgment of the team leader. All modifications will be documented in the field logbook or on the field sampling data sheets.

8.0 DATA AND RECORDS MANAGEMENT

Follow procedures described in SOP 13.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

Follow procedures described in Section 5.3 of SOP 12.

10.0 REFERENCES

The procedures set forth in this SOP are intended for use with the following SOPs:

- SOP Number 11, Decontamination of Sampling Equipment
- SOP Number 12, Sample Management
- SOP Number 13, Data Management

STANDARD OPERATING PROCEDURE NO. 7
DIRECT GAMMA FIELD SURVEY

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

The purpose of the baseline gamma survey is to document pre-operational gamma exposure rates on the Ross ISR Project Site. The gamma survey will provide a radiological basis for the eventual reclamation of the site.

1.1 Introduction

Reclamation of uranium mining/milling sites or other sites where naturally occurring radioactive materials are present usually requires characterizations of gamma exposure rates and Ra-226 concentrations in soil. Establishing pre-operational (background) and post-operational conditions for these radiological parameters is important for assessment of areas requiring remediation. Past approaches include taking discrete gamma measurements and soil samples across a systematic grid pattern. For example, a radial grid sampling approach is indicated by the U.S. Nuclear Regulatory Commission (USNRC 1980) in Regulatory Guide 4.14 for uranium mills (NRC, 1980), with 40 soil samples collected along a radial grid (Figure 1) and 80 individual discrete gamma measurements collected along a similar pattern.

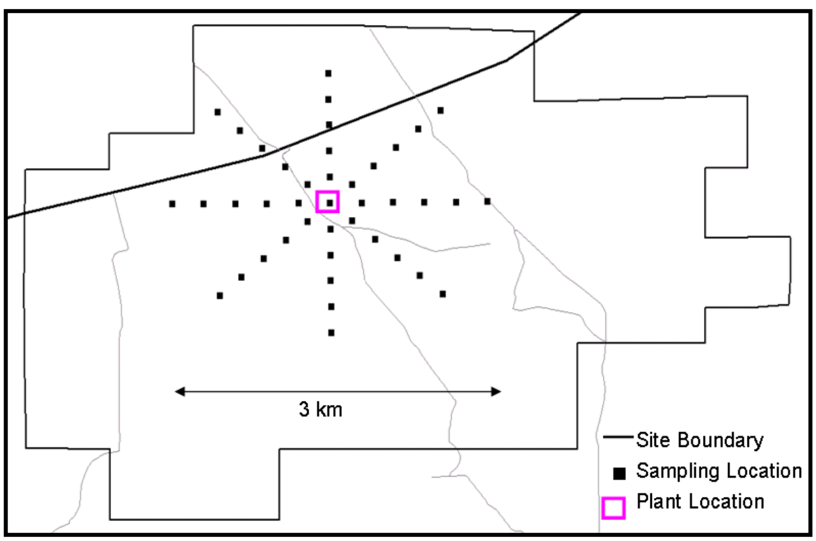


Figure 1: Soil sampling location grid design as indicated in NRC Regulatory Guide 4.14.

More recent radiological survey guidelines found in MARSSIM, the Multi-Agency Radiation Survey and Site Investigation Manual (USNRC, 2000), also indicate grid-based designs for soil sampling and direct measurement of radionuclides in soil, but the number of soil samples needed varies according to statistical requirements and continuous gamma scanning (rather than discrete gamma measurements) is used to augment the soil sampling by detection of any elevated areas in between grid soil sampling locations using an experimentally established relationship between gamma scan readings and soil Ra-226 concentrations.

At some sites, natural background soil Ra-226 concentrations are quite variable and may exceed levels commonly used as cleanup criteria. In addition, pre-existing areas of local contamination may exist through previous activities at the site, e.g., at the Ross site former R&D mine. Careful radiological characterization of baseline conditions can help to identify such situations and facilitate appropriate planning. If such areas are not identified prior to site operations, they can result in unnecessary concerns from regulators and the public leading to potential associated financial costs and public perception issues. Baseline radiological characterization of background and potentially impacted areas can help improve identification of areas actually contaminated by site operations, help to develop strategic, precisely targeted, and effective reclamation plans, and help to improve verification of the effectiveness of remedial measures.

This work plan is designed to help address the above issues based on a combination of current state-of-the-art radiological survey systems and characterization techniques along with traditionally accepted scientific methods and regulatory guidance protocols.

1.2 General Approach

Since the above mentioned NRC guidance documents were published, advanced GPS-based gamma scanning systems with automated electronic data collection have been developed and used extensively in the field (Meyer et al., 2005a; Meyer et al., 2005b; Johnson et al., 2005; Whicker et al., 2008). These systems can record up to 3,600 individual gamma readings and corresponding GPS measurements per hour, providing a detailed record of gamma exposure rate conditions across scanned areas. Multiple scanning systems mounted on vehicles or backpacks can quickly survey large areas and rough terrain while providing a high spatial density of measurements. This gamma survey technology represents a substantial increase in the amount of radiological information that can be efficiently collected relative to technology available when earlier agency guidance documents were published.

Recent GPS-based gamma scanning technologies have become widely used and are consistent with radiological survey guidelines outlined in MARSSIM (NRC, 2000). For example, surveys of this type are described in several recent license applications submitted to the USNRC for other in situ uranium recovery facilities (e.g., see Uranium One Americas 2008 *and* Energy Metals Corporation 2007.

For this project, gamma surveys at the site(s) will utilize GPS-based gamma scanning systems mounted on specially designed support systems attached to trucks, off highway vehicles (OHVs), all terrain vehicles (ATVs), or backpacks (Figure 2), depending on the nature of terrain to be covered, availability of vehicle types, or other site circumstances.

Figure 2: 3-detector OHV systems (top left); 2-detector backpack system (top right); 2- or 3-detector truck system (bottom left); 2-detector ATV system (bottom right).

In conjunction with the gamma scanning, the NaI-based scintillometers used for scanning will be cross-calibrated against a high-pressure ionization chamber (HPIC). These data will be used to statistically convert raw NaI scan data to estimates of true gamma exposure rate. This will allow a common (instrument independent) basis of comparison for evaluations with future gamma surveys (surveys that may use different gamma survey instruments, configurations, or measurement technologies).

Furthermore, correlations between NaI gamma readings and Ra-226 concentrations in surface soils (0-15 cm) will be established. These correlations will enable spatial and statistical information about soil Ra-226 concentrations to be extracted from raw NaI gamma survey data in order to characterize spatial distributions of Ra-226 concentrations in surface soils across all scanned areas. Finally, geographical information systems (GIS) software can be used for statistical conversions on raw scan data sets, interpolation with kriging methods, and for data mapping and presentation purposes.

2.0 SUMMARY OF METHOD

The baseline gamma scan is a one-time process undertaken prior to the start of site construction. At a minimum, the scan is intended to cover the areas of the site that may be impacted by future operations. The scan will be performed during dry conditions and when the ground is not covered with snow or ice. Post-operational characterization surveys and final status decommissioning also will be conducted using similar methods and technologies for comparisons against the baseline survey results.

3.0 SAFETY

The following precautions should be taken when conducting the gamma survey:

- All vehicle safety rules must be observed during use of mechanized transport (all terrain vehicle or truck) for scanning.
- Care should be taken to avoid interactions with poisonous snakes, insects, or plants that may be encountered during scanning, particularly in the event foot (or backpack) scanning is required in some areas.

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the gamma survey
- Overseeing all gamma scanning activities
- Reviewing field activities and associated documentation to ensure that all activities are in compliance with the Health and Safety Plan (HASP), Preoperational Radiological Baseline Sampling and Analysis Plan (SAP) and this SOP.
- Ensuring that all individuals involved in gamma scanning are properly trained in the procedures outlined in this SOP.

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information

- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment is required for sediment and soil sampling:

- GPS-based gamma scanning systems mounted on specially designed support systems attached to trucks, off highway vehicles (OHVs), all terrain vehicles (ATVs), or backpacks
- NaI-based scintillometers
- HPIC
- Computers loaded with GIS software

Use of equipment is summarized in Section 9.0.

7.0 PROCEDURE

The following subsections describe the procedures that should be followed when conducting gamma scans. References to specific manufacturers and models of equipment described are provided as examples. Equipment of commensurate capabilities, quality and specifications may be used.

7.1 Gamma Systems Equipment, Setup and Use

Details concerning which type of scan system configuration(s) and mounting infrastructure will be used for scanning the site(s) will be formalized as more information becomes available. The basic scanning systems, however, are essentially the same for all mounting configurations. Each individual scanning system will consist of a Ludlum 44-10 NaI gamma detector and paired SiiRF III GPS receiver (WAAS enabled). For each scan system, the NaI detector will be coupled to a Ludlum 2350 rate meter carried in the cargo area of the vehicle or the backpack, respectively. Simultaneous GPS and gamma exposure rate data for each independent scanning system will be software. recorded every 1-2 seconds with on-board personal computers and appropriate data acquisition

System configurations mounted on vehicles or backpacks will involve approximately 4-8 foot spacing between detectors (measured perpendicular to direction of travel), depending on which system is used and the need to negotiate tall vegetation or other obstacles. The detectors will be positioned at approximately 3 feet above the ground surface. Three-foot detector heights are commonly used for characterization surveys..

During scanning, GPS-based tracking software will also be used with a separate GPS receiver to track the progress and coverage of each day's scan trajectories. Base maps of site boundaries or other site features of primary interest will be loaded on the tracking software to help guide and limit coverage to intended survey areas. This will minimize trajectory overlap and help to insure adequate ground coverage.

In areas of particular interest such as elevated gamma regions, well fields, and planned process facilities, scanning will be conducted such that ground survey coverage will be as high as practicable (e.g. as close to 100% as is reasonable and effective at characterizing smaller scale spatial distributions). Scanning speeds may range from about 2-8 mph, depending on the type of scan system used, the nature of the terrain, and the observed amount of spatial variation in readings across given areas (e.g. small areas with higher readings are typically scanned at slower speeds and higher density of measurements).

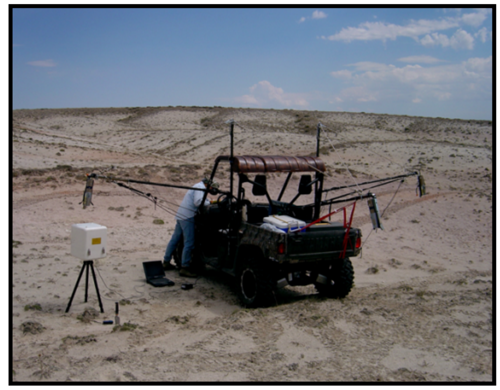
After each day of gamma scanning, the data will be downloaded into a project database and mapped using appropriate software. This will enable immediate onsite assessment of results for adequacy of coverage and for any problems that may have occurred during data acquisition throughout the day by assessment of consistency in readings between onboard detectors. Problems or inconsistencies will result in close investigation of affected system performance and may result in elimination of respective data until problems are resolved.

7.2 Cross-Calibration of NaI Detectors Against a High-Pressure Ionization Chamber

Gamma exposure rates measured by NaI detectors are only relative measurements as response characteristics of NaI detectors are energy dependent. True gamma exposure rates are best measured with less energy dependent systems such as the HPIC. Alternatively, equivalent dose rates may be directly measured in the field with a microrem meter. Microrem meters are essentially energy independent in the range of gamma energies expected to be encountered in the field for this project. Depending on the radiological characteristics of a given site, NaI detector readings can differ significantly from corresponding HPIC or microrem meter measurement values. Such differences are usually proportional to the magnitude of exposure rate being measured..

NaI systems are useful because they can quickly and effectively demonstrate relative differences between pre- and post-operational gamma exposure rate conditions. Unless the same equipment and scanning geometry is used for both surveys, however, it is necessary to normalize the data to a common basis of comparison. This is the purpose of performing HPIC/NaI cross-calibration measurements. Cross-calibration insures that the results of future gamma scans, which may use different detectors, detector types, or measurement geometries, can be meaningfully compared against the results of pre-operational gamma surveys.

To perform HPIC/NaI cross-calibrations, static measurements are taken at 6-10 discrete locations that span a representative range of exposure rates found at each site. At each measurement location, 10 individual readings are collected from the HPIC as well as from one or more randomly chosen NaI detectors used for site scanning. Pictures of this process are shown in Figure 3. Values for each instrument type and respective detector height are averaged for each location. The resulting paired HPIC/NaI data are analyzed by linear regression to enable conversion of NaI-based gamma survey data to approximate 3-foot HPIC equivalents. Validity of applying cross-calibration results from a randomly selected subset of NaI detectors used for the survey to all scan data is established from the data quality control results (discussed later).



7.3 Soil Sampling and Gamma/Ra-226 Correlation

The primary objective of soil sampling conducted in conjunction with the gamma survey will be to develop a predictive statistical correlation between gamma readings and soil Ra-226 concentrations in order to estimate soil Ra-226 concentrations across scanned areas. A product of the U-238 decay series, Ra-226 has a relatively long half-life (about 1,600 years) and is thus an important radionuclide with respect to baseline characterizations at uranium recovery sites. Cosmic sources of gamma radiation are relatively constant at locations with a given latitude and elevation (Stone et al., 1999). Differences in gamma survey readings at the site are thus expected to be due to differences in gamma-emitting radionuclides in soils at or near the ground surface. Soil Ra-226 concentrations can influence gamma survey readings via short-lived gamma-emitting progeny of Rn-222 (Pb-214 and Bi-214).

Gamma/Ra-226 correlation data will be collected simultaneously at the same locations as HPIC/NaI cross calibration measurements in order to also cover a representative range of gamma readings found at the site(s). Composite soil samples will be collected at these locations across 100 m^2 plots. A diagram depicting the approximate sampling design for 100 m^2 plot sampling and gamma measurements is shown in Figure 4. Within each 100 m^2 plot, 10 soil sub-samples will be collected to a depth of 15 cm then composited into a single sample. A separate gamma scan of each 100 m^2 plot will also be conducted, and the average reading for the plot will be subsequently calculated to pair with the corresponding soil sampling result for Ra-226.

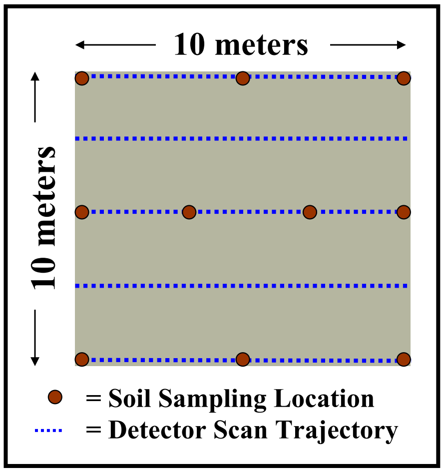


Figure 4: Approximate design of 100 m^2 soil sampling/scanning correlation plots.

GPS readings will be collected at the center of each correlation plot location and recorded in the field log book. Soil samples will be placed in plastic baggies and labeled. An analytical request and chain-of-custody form will be filled out and shipped with the samples to a qualified commercial laboratory for Ra-226 analysis.

8.0 DATA AND RECORDS MANAGEMENT

A field log will be maintained daily during the scan. The site conditions, scan location for the day, unusual occurrences, scan technicians, and all other pertinent data that would allow the scan conditions to be reconstructed without the assistance of the technician will be recorded.

Gamma scan data will be maintained in a secure data file as described in the procedures above.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

All radiological characterization projects conducted will include data QA/QC protocols. In general, quality assurance (QA) includes qualitative factors that provide confidence in the results, while quality control (QC) includes quantitative evidence that supports the validity of results (e.g. data accuracy and precision).

11.1 QC Documentation

Just prior to the gamma survey of each site, instrument QC measurements will be performed for each NaI detector used for scanning. This will be done in a controlled indoor environment to quantify the consistency of readings between detectors under identical measurement geometries. The mean of 20 individual QC measurements of background, as well as a Cs-137 check-source will be determined under a designated and consistent geometry. For normally distributed count data, over 99% of measurements are expected to fall within ± 3 standard deviations from the mean. Any instrument with measurements falling outside ± 3 standard deviations from the mean of all QC measurements on both background and check source charts indicates unacceptable instrument performance. All detectors used for field scanning must perform within acceptable QC limits under these criteria. Control charts will be constructed to document instrument QC data (example instrument control charts are shown in Figure 5).

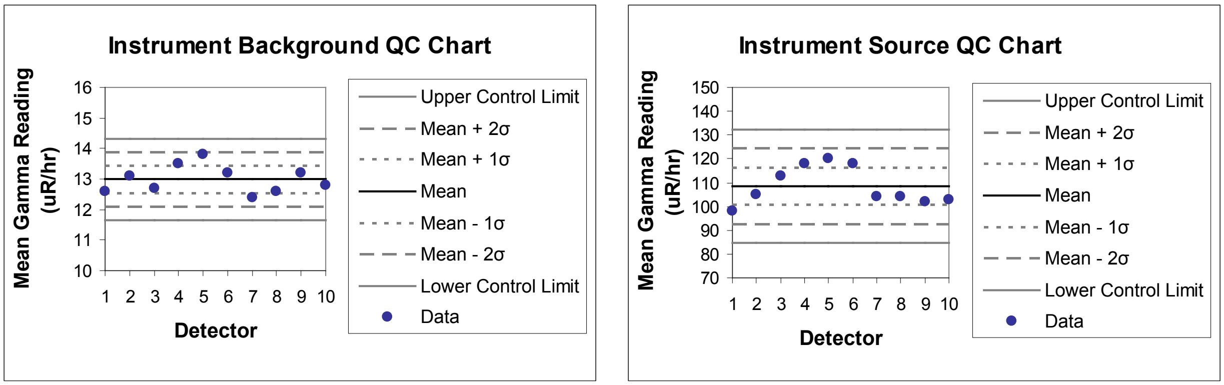


Figure 5: Example background and source instrument control charts for scan system detectors.

For each day of the survey(s), onsite QC measurements for each scanning system will be performed along a designated “field strip” with relatively uniform background readings in the scan staging area. This provides an indication of total measurement variability for the systems under actual field conditions (e.g. includes variations due to temporal fluctuations in ambient gamma fields, small differences in measurement location/geometry, etc.). The same criteria used for instrument QC assessment apply to field strip QC measurements and all detectors must demonstrate acceptable performance for the survey (Figure 6).

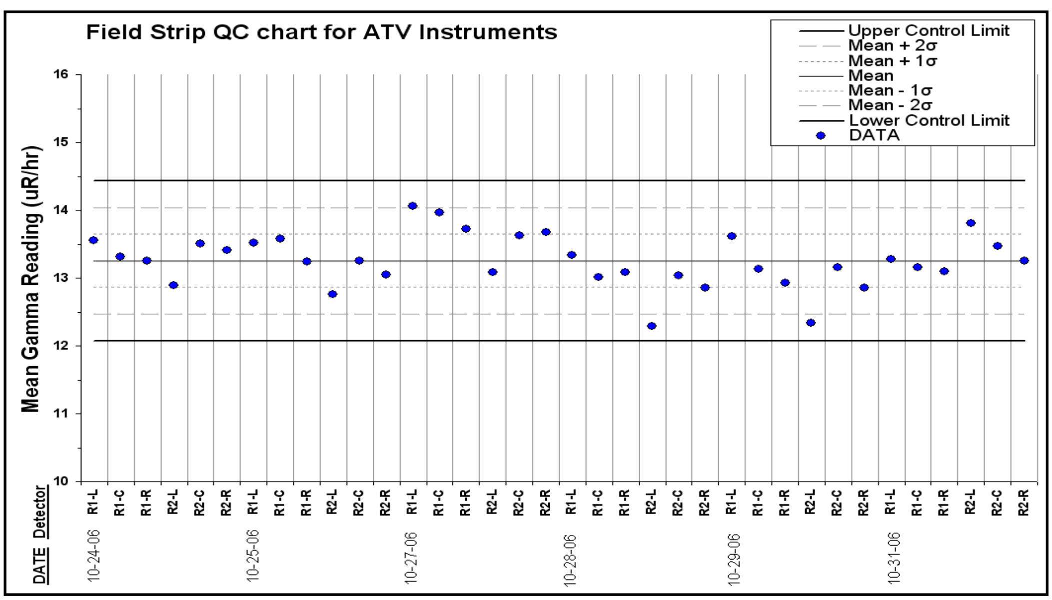


Figure 6: Example field strip control charts for ATV scan system detectors.

With respect to soil sample analysis results from the contract laboratory, QC data and information will be included with the analytical report to note any flags or analytical problems with respect to quality control (e.g. certified reference material standards, duplicate sample analyses, etc.) as conducted according to certified laboratory standards.

9.1 Data Quality Assurance Factors

- All detectors used for gamma scanning at the site(s) will have been calibrated by the manufacturer within one year prior to the date of use on this project (calibration certificates will be included in the radiological baseline report).
- The HPIC will have been calibrated within one year prior to the dates of use on the project (calibration certificate will be included in the radiological baseline report).
- Chain-of-custody protocols were followed for soil sampling and contract laboratory analyses as described in SOP 4, *Soil and Sediment Sampling* (relevant forms will be included in the radiological baseline report).

10.0 REFERENCES

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STANDARD OPERATING PROCEDURE NO. 8
SURFACE WATER SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

This procedure provides guidance regarding the collection of surface water samples for the Ross ISR Radiological Baseline and Operational Monitoring Programs. The Standard Operating Procedure describes the equipment, precautions, field procedures, record keeping, and quality assurance/quality control (QA/QC) protocols to be employed when collecting surface water samples.

2.0 SUMMARY OF METHOD

Surface water samples are collected from water bodies within and/or potentially affected by operations related to the recovery of uranium. Baseline samples are obtained prior to the start of operations in order to provide a basis for assessing the environmental impacts of such operations and requirements for remediation of site. The monitoring program will continue during operations in accordance with regulatory requirements. The water samples will be submitted to a contract laboratory for analysis for naturally occurring radionuclides in the uranium decay series and specific chemical constituents as required. The number of samples, locations, analytes, and sampling schedule are described in the Preoperational Radiological Baseline Sampling and Analysis Plan (SAP), project-specific work plans and the Ross ISR Environmental Monitoring Program (EMP).

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.
- The sampling schedule and equipment list should be checked prior to sampling to ensure that all required samples are collected and necessary equipment is available for the sampling event.
- Sample collection equipment shall be decontaminated in accordance with SOP 11. Decontamination supplies will be provided such that sampling equipment can be decontaminated in the field.
- Surface water samples should be collected using care to prevent disturbing bottom sediments and/or collecting floating materials.
- If surface water must be collected under winter conditions, attempts may be made to break through ice. If the ice cannot be broken, no surface water sample will be collected at that time and this will be documented on the Surface Water Sample Collection Form (Attachment SOP 8 -1) or in the log book. An attempt shall be made to sample the location within the required sampling time period. In the event that the ice can be broken, the following criteria must be satisfied in order to obtain a surface water sample:
    - Collection of the surface water sample will not place sampling personnel in any danger.

- Surface water located beneath the ice over streams is not stagnant. (Pond or impoundment water will likely be stagnant.)
- Broken and residual ice is removed via surface water flowing beneath the ice.
- Sufficient water is available to collect the surface water sample.
- The sampler must wear a life preserver when working around bodies of water that could present a hazard.

4.0 INTERFERENCES

Small amounts of foreign material (i.e. dirt, grease, etc.) can contaminate an entire batch of samples.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the surface water sampling program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the surface water sampling program are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the surface water sampling program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)

- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following sampling equipment must be available (as necessary) prior to the start of sampling:

- Water resistant ink pen
- Preservatives as required
- Collection containers (e.g., beaker, dipper)
- Water quality field meters (Instrument manuals should be taken into the field.)
- Coolers and ice packs
- pH buffers and conductivity standards as required
- Filtering equipment as required
- Sample bottles
- Latex gloves
- Appropriate health and safety equipment, as specified in the Health and Safety Plan
- Surface Water Sample Collection Form (Attachment SOP 8 -1)
- Chain-of-Custody forms
- Field log book

7.0 PROCEDURE

7.1 Prior to Sampling

Prepare schedules and coordinate with staff, SENES Consultants, and WWC Engineering if appropriate. Clear all dates and times of field work at least one week in advance:

Jeff Campbell, Strata Energy (307)467-5995
Ben Schiffer, WWC Engineering (307) 672-0761 ext. 148 (if Jeff Campbell cannot be reached)
Lisa Manglass, SENES (303) 524 1118

7.2 Field Instrument Calibration

Water quality field meters, including the pH/EC/temperature meter, require calibration at least every day prior to use. Calibration time and readings will be recorded in a notebook specific to each instrument. Specific instructions for calibrating the instruments are provided in the manuals for each separate instrument.

7.3 Decontamination

All sampling equipment shall be decontaminated prior to sample collection according to SOP 11.

7.4 Presample Inspection

Prior to each water sample collected, an inspection of the water source shall be made that includes abnormal colors, odors or other unusual condition. Record any abnormalities on the sampling form.

7.5 Surface Water Flow or Reservoir Volume

- For streams, flow is measured either instantaneously measuring flow with a current meter or a continuous flow recording instrument.
- For reservoirs, estimate volume by measuring average length and depth of reservoir.

7.6 Sample Collection

Surface water samples should be collected based upon size and type of source as described below:

- If the surface water sample is to be collected from a stream that is less than three (3) feet wide, the samples should be collected from the center of the stream.
- If the surface water sample is to be collected from a stream which is greater than three (3) feet wide and less than ten (10) feet wide, the samples should be collected from three (3) locations spaced evenly across the width of the stream.
- If the surface water sample is to be collected from a stream which is greater than ten (10) feet wide, the samples should be collected from five (5) locations spaced evenly across the width of the stream and composited.
- If the stream is too deep to wade across to collect surface water samples, the sample should be collected from the bank of the stream with a sample container attached to a pole.
- If the surface water sample is to be collected from stationary water, the samples shall be collected from at least five (5) equally spaced locations around the stationary water, if possible, and composited.

A beaker or dipper should be utilized to collect and transfer sufficient surface water samples to a compositing container such that all required samples can be obtained via the same composited surface water sample. The beaker or dipper utilized to collect and transfer surface water samples should be rinsed times prior to initiating sample collection. The inside of the sample containers should be rinsed separate times with water from the sampling location prior to filling the sample container from the compositing container.

For samples to be analyzed for volatile or semi-volatile organics, the sample containers should be filled from the compositing container such that no air remains in the sample bottle. The sample should immediately be preserved and placed in an ice-filled cooler, if required. Sample containers for the same analysis should be filled immediately after one another. Sample containers for samples that do not require filtration should be filled prior to sample containers requiring filtration.

The following information shall be recorded on the Surface Water Collection Form at each sample location. (Items not applicable will be labeled as such).

- The sampling location
- The actual time and date when the sample was obtained
- The person(s) performing the sampling
- The temperature, pH, conductivity, turbidity and dissolved oxygen
- The sample identification numbers, including those for any QA/QC samples
- The number of samples taken
- All field observations including color, odor, turbidity of the sample, floating solids, visible foam, and oily wastes which produce a sheen on the surface of the water
- Any irregularities or problems that may have a bearing on the sample QA/QC

Field notes shall be kept during sampling activities and recorded on the surface water collection form. Field notes shall be such that a person not involved in the sampling could reconstruct the sampling event at a later date and may include:

- Names of personnel present during sampling
- Weather conditions
- Location, date and time of sampling

7.7 Water Quality Field Measurements

Rinse the probe with DI water, allow to air dry, not waiting more than a few moments, and insert the probe into an aliquot from the sample container. Holding the probe vertically and at least one-half inch from all surfaces of the container turn on the meter. Allow the reading to stabilize and record the field measurements on the water sampling form. Turn off the meter, remove the probe from the sample, and rinse the probe with DI water.

7.8 Sample Filtration

Samples that require dissolved analyte concentration analysis shall be filtered at the time of sample collection in accordance with the instructions in the filtration device manual.

8.0 DATA AND RECORDS MANAGEMENT

All records and documentation associated with sample collection, including the Surface Water Sample Collection form shall be retained in accordance with its Quality Assurance Plan and regulatory requirements. Procedures outlined in SOP 12 should be followed for sample management, including sample labeling, handling and documentation

8.1 Field Log Book

All information pertinent to field sampling must be recorded in a log book, regardless of the type of sample. The field log book should be a bound book, preferably with consecutively numbered pages. A log entry shall contain, at a minimum, the following information:

- The sample identification number
- Location of sampling
- Name of sampling technician
- Date and time of sampling
- Field analysis results as appropriate (pH, cond., temp, etc)
- Number and volume of sample containers and corresponding analyses to be performed
- Method of sampling
- Purpose of sampling
- Weather conditions

Sampling situations vary widely, so no general rule can be given for the amount of information required. The best guideline is to record sufficient information necessary to complete the Surface Water Sample Collection Form (Attachment 8-1), so that the sampling event could be reconstructed if necessary without relying on the sampling technician’s memory. The completed field log book(s) should be maintained and filed chronologically or as specified in the Quality Assurance Plan. If possible, the coordinates of the sampling location should be recorded in the field log book.

8.2 Surface Water Sample Collection Form

The Surface Water Sample Collection Form is included in this SOP attachment 8-1. Once completed the Surface Water Data Sheet shall be maintained in accordance with the Ross ISR Quality Assurance Plan

8.3 Chain of Custody Form

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC samples may be collected during surface water sampling activities and are designed to assist in the identification of potential sources of sample contamination and to evaluate the potential error introduced during sample collection and handling. QA / QC sample requirements are to be defined by the Consulting Project Manager. Field QA/QC methods are described below:

Field QA/QC methods related to chemical data may include:

- Field Duplicate Samples – samples that have been divided into two or more portions at some step in the measurement process. Each portion is then carried through the remaining steps in the measurement process. An example of a field duplicate sample is a water sample that has been collected and poured into two sets of sample containers.

- Equipment Rinsate Samples – samples that are obtained by collecting deionized or distilled water that has contacted the decontaminated sample collection equipment (i.e. beaker or dipper). These samples are then sent to the laboratory for analysis of the same parameters as the sample taken with the same equipment. These samples will be used to determine if decontamination procedures have been effective. Equipment rinsate samples may also be taken from decontaminated equipment planned for dedicated used, prior to use at the dedicated location.
- Field Blank Samples – samples that are collected by pouring deionized water directly into the sample container. The blank will be analyzed for the same parameters as the samples that were collected or are associated with that blank.
- Matrix Spike Samples – The laboratory will analyze the sample for the analytes being measured in other related samples within the sample delivery group. The laboratory will then add (spike) a known quantity of a specific analyte to the sample and reanalyze the sample for the spiked analyte. The percent recovery of the spiked analyte is determined and matrix interferences are evaluated. A sufficient quantity of sample will be collected to allow the laboratory to spike the sample for each analyte to be analyzed.

QA/QC of field measuring equipment involves the review of calibration procedures and the use of standards. QA/QC of field sampling documentation involves the routine verification of field log-books and/or forms and the required sign-off on the Chain-of-Custody (COC) forms. Each QA/QC sample should be labeled with the correct QA/QC identification number and sent along with the other samples to the independent laboratory for analysis. The number and frequency of QA/QC samples to be collected is generally defined as 10% of the samples taken (i.e. when collecting monthly samples this would correlate to one of each type of field QA/QC sample every ten months) or one per year, whichever is more frequent. Specific work plans and the Environmental Monitoring Program may specify a different frequency of QA/QC samples. Sample containers and preservatives for QA/QC samples should be prepared in the same manner as all other sample containers.

10.0 REFERENCES

The following Standard Operating Procedures should be read and followed, when applicable, in the implementation of this SOP.

- SOP 11, Decontamination of Sampling Equipment
- SOP 12, Sample Management

STANDARD OPERATING PROCEDURE NO. 9
GROUND WATER AND DOMESTIC WELL SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

The purpose of this standard operating procedure (SOP) is to describe the procedures for the collection of groundwater samples for establishing baseline concentrations of key radionuclides and chemical properties. The baseline will help determine potential impacts from mining activities during operations or closure, as well as defining the baseline water resource for purposes of salvage and replacement within the mining operation and ultimate reclamation. Section 3.9 of the Sampling and Analysis Plan defines sampling locations and radiochemical analysis requirements for the preoperational baseline program.

Described herein are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the actual procedures used must be documented and described in the groundwater sampling program report.

2.0 SUMMARY OF METHOD

Ground water samples are collected from monitor wells and permitted and unpermitted wells within and/or potentially affected by operations related to the recovery of uranium. Baseline samples are obtained prior to the start of operations in order to provide a basis for assessing the environmental impacts of such operations and requirements for remediation of site. The monitoring program will continue during operations in accordance with regulatory requirements. The water samples will be submitted to a contract laboratory for analysis for naturally occurring radionuclides in the uranium decay series and specific chemical constituents as required. The number of samples, locations, analytes, and sampling schedule are described in the Preoperational Radiological Baseline Sampling and Analysis Plan (SAP), project-specific work plans and the Ross ISR Environmental Monitoring Program (EMP).

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.
- The sampling schedule and equipment list should be checked prior to sampling to ensure that all required samples are collected and necessary equipment is available for the sampling event.
- Sample collection equipment shall be decontaminated in accordance with SOP 11. Decontamination supplies will be provided such that sampling equipment can be decontaminated in the field.

4.0 INTERFERENCES

Small amounts of foreign material (i.e. dirt, grease, etc.) can contaminate an entire batch of samples.

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the ground water sampling program
- Ensuring the oversight of all monitoring activities
- Ensuring that all individuals involved with implementing the ground water sampling program are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the surface water sampling program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment maybe used in the process of collecting groundwater samples:

- ½ Gallon water sampling bottles

- 1 liter sampling bottles
- 250 mL sampling bottles
- VOC sampling vials
- Labels for bottles or markers for pre –labeled bottles
- 5 gallon plastic bucket
- Discharge hose (garden hose)
- Preservatives for samples, when applicable
- Water quality field meters
- Water level measurement probe
- Groundwater sampling equipment (generator, Readi-flow,
- In-Situ Rugged Reader
- Appropriate forms: Chain of Custody form(see SOP 12), Land Owner Water Sampling form(attached), and Sample Information form (attached)
- Maps for locating sample locations
- Weather resistant, bound field logbook
- Digital camera
- Filtering equipment, as required
- Appropriate health and safety equipment, as specified in the Health and Safety Plan

7.0 PROCEDURE

The following sample procedure will be used in the collection of groundwater samples. Deviations from the sampling procedure will be noted in the log book.

7.1 Prior to Sampling

Prepare schedules and coordinate with staff, SENES Consultants, and WWC Engineering if appropriate. Clear all dates and times of field work at least one week in advance:

Jeff Campbell, Strata Energy (307)467-5995
Ben Schiffer, WWC Engineering (307) 672-0761 ext. 148 (if Jeff Campbell cannot be reached)
Lisa Manglass, SENES (303) 524 1118

7.2 Field Instrument Calibration

Water quality field meters, including the pH/EC/temperature meter, require calibration at least every day prior to use. Calibration time and readings will be recorded in a notebook specific to each instrument. Specific instructions for calibrating the instruments are provided in the manuals for each separate instrument.

7.3 Decontamination

Prior to sample collection all field equipment shall be decontaminated in accordance with SOP 11.

7.4 Presample Inspection

Prior to sample collection an inspection of the well shall be made including the operation of the well, operation of the well, and status of the well including water color, odors or other unusual conditions. Record any abnormalities on the sampling form.

7.5 Sample Collection

The following details the sampling procedures for groundwater wells:

1) Measure static water level if possible and conduct well head inspection.
2) For regional baseline wells download levels from pressure transducer using In-Situ Rugged Reader. Program the current water level into the Rugged Reader.
3) Purge water for at least 3 casing volumes or until field parameters.
4) While purging water measure and record field parameters including; pumping rate, volume purged, pH, EC, water and air temperature, DO, ORP and turbidity
5) Collect samples when field parameters have stabilized (two consecutive readings within 10%)
6) Fill sample bottles and add preservative if required. Filter for dissolved metals (peristaltic pump and inline filter).

Radon Sampling Procedure, as Required

Follow the sample collection procedures described in above, however the following procedure must be used to collect the radon sample.

- Insert discharge line (typically garden hose) into clean five gallon plastic bucket and let run for 10 to 15 minutes. Adjust discharge flow so that water is slightly overflowing bucket.
- Submerge proper VOC sampler bottle into water in bucket in upright position and let fill. As VOC bottle is submerged in water, place cap on bottle and turn upside down; look at the top of the upside down bottle to insure there are no air bubbles. If there are bubbles, repeat processes until there are no bubbles.

The following information shall be recorded on the Ground Water Collection Form at each sample location. (Items not applicable will be labeled as such).

- The sampling location
- The actual time and date when the sample was obtained
- The person(s) performing the sampling
- The temperature, pH, conductivity, turbidity and dissolved oxygen
- The sample identification numbers, including those for any QA/QC samples
- The number of samples taken
- All field observations including color, odor, turbidity of the sample, floating solids, visible foam, and oily wastes which produce a sheen on the surface of the water
- Any irregularities or problems that may have a bearing on the sample QA/QC

Field notes shall be kept during sampling activities and recorded on the surface water collection form. Field notes shall be such that a person not involved in the sampling could reconstruct the sampling event at a later date and may include:

- Names of personnel present during sampling
- Weather conditions
- Location, date and time of sampling

7.7 Sample Management

Procedures outlined in SOP 12 should be followed for sample management, including sample labeling, handling and documentation.

8.0 DATA AND RECORDS MANAGEMENT

All records and documentation associated with sample collection, including the Surface Water Sample Collection form shall be retained in accordance with its Quality Assurance Plan and regulatory requirements.

8.1 Field Log Book

All information pertinent to field sampling must be recorded in a log book, regardless of the type of sample. The field log book should be a bound book, preferably with consecutively numbered pages. A log entry shall contain, at a minimum, the following information:

- The sample identification number
- Location of sampling
- Name of sampling technician
- Date and time of sampling
- Field analysis results as appropriate (pH, cond., temp, etc)
- Number and volume of sample containers and corresponding analyses to be performed
- Method of sampling
- Purpose of sampling
- Weather conditions

Sampling situations vary widely, so no general rule can be given for the amount of information required. The best guideline is to record sufficient information necessary to complete the Ground Water Sample Collection Form (Attachment 9-1), so that the sampling event could be reconstructed if necessary without relying on the sampling technician's memory. The completed field log book(s) should be maintained and filed chronologically or as specified in the Quality Assurance Plan. If possible, the coordinates of the sampling location should be recorded in the field log book.

8.2 Surface Water Sample Collection Form

The Ground Water Sample Collection Form is included in this SOP attachment 9-1. Once completed the Grounde Water Data Sheet shall be maintained in accordance with the Ross ISR Quality Assurance Plan

8.3 Chain of Custody Form

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC samples may be collected during surface water sampling activities and are designed to assist in the identification of potential sources of sample contamination and to evaluate the potential error introduced during sample collection and handling. QA / QC sample requirements are to be defined by the Consulting Project Manager. Field QA/QC methods are described below:

Field QA/QC methods related to chemical data may include:

- Field Duplicate Samples – samples that have been divided into two or more portions at some step in the measurement process. Each portion is then carried through the remaining steps in the measurement process. An example of a field duplicate sample is a water sample that has been collected and poured into two sets of sample containers.
- Equipment Rinsate Samples – samples that are obtained by collecting deionized or distilled water that has contacted the decontaminated sample collection equipment (i.e. beaker or dipper). These samples are then sent to the laboratory for analysis of the same parameters as the sample taken with the same equipment. These samples will be used to determine if decontamination procedures have been effective. Equipment rinsate samples may also be taken from decontaminated equipment planned for dedicated used, prior to use at the dedicated location.
- Field Blank Samples – samples that are collected by pouring deionized water directly into the sample container. The blank will be analyzed for the same parameters as the samples that were collected or are associated with that blank.
- Matrix Spike Samples – The laboratory will analyze the sample for the analytes being measured in other related samples within the sample delivery group. The laboratory will then add (spike) a known quantity of a specific analyte to the sample and reanalyze the sample for the spiked analyte. The percent recovery of the spiked analyte is determined and matrix interferences are evaluated. A sufficient quantity of sample will be collected to allow the laboratory to spike the sample for each analyte to be analyzed.

QA/QC of field measuring equipment involves the review of calibration procedures and the use of standards. QA/QC of field sampling documentation involves the routine verification of field log-books and/or forms and the required sign-off on the Chain-of-Custody (COC) forms. Each QA/QC sample should be labeled with the correct QA/QC identification number and sent along with the other samples to the independent laboratory for analysis. The number and frequency of QA/QC samples to be collected is generally defined as 10% of the samples taken (i.e. when collecting monthly samples this would correlate to one of each type of field QA/QC sample every ten months) or one per year, whichever is more frequent. Specific work plans and the Environmental Monitoring Program may specify a different frequency of QA/QC samples. Sample containers and preservatives for QA/QC samples should be prepared in the same manner as all other sample containers.

10.0 REFERENCES

The following Standard Operating Procedures should be read and followed, when applicable, in the implementation of this SOP.

- SOP 11, Decontamination of Sampling Equipment
- SOP 12, Sample Management

STANDARD OPERATING PROCEDURE NO. 10
ANIMAL TISSUE SAMPLING

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) is provided for the purpose of identifying and sampling food sources that could allow the entrance of naturally occurring radioactive materials in to the human food chain. It describes methods to be used in collection of animal tissue sampling. It addresses seasonal timing, selection of species, sampling procedures, personnel responsibilities, and quality assurance/quality control (QA/QC) procedures. While there are some crops grown inside or near the permit area that could become consumed by people or by animals that are then consumed by people, sampling of food crops is covered in SOP 6 Food Crop and Vegetation Sampling.

2.0 SUMMARY OF METHOD

2.1 Time of Sampling

- Samples of livestock will be taken when animals are sent to slaughter by homeowners. Homeowner surveys will provide approximate times that livestock samples may be available for sampling, ranging from July to November.
- Samples of wild game will collected during the hunting season, in the months of October or November.
- Samples of fish will be collected in the late summer or early fall when the fish population has had ample time to grow over the warm months, but well before the reservoir begins to freeze.

2.2 Selection of Animals for Sampling

The only livestock raised in or near the permit area are cattle and horses. As the horses are not used as a food product, only cattle will be sampled. The result of resident interviews has shown that while there are many animals capable of being hunted in the permit area, only deer and antelope are regularly hunted and used for human consumption. Samples of deer and antelope meat will be analyzed accordingly. Fish populations have only been observed in the Oshoto Reservoir. Fishing in this body of water should provide a sample adequate for this baseline study.

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the animal tissue sampling program
- Ensuring the oversight of all sampling activities
- Ensuring that all individuals involved with implementing the animal tissue sampling program are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the animal tissue sampling program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment and materials may be used during plant sample collection:

- Chain of Custody forms,
- Contact information for residents providing samples

7.0 PROCEDURE

The meat processing plant/ facility where cattle are taken for slaughter or deer/antelope are taken for processing will be contacted no later than 24 hours of their receiving the animals. A request for a cutting of meat, approximately 18 pounds (8kg) will be requested from edible meat. No liver/blood samples will be taken in this process.

Residents will be provided compensation for beef samples donated based on rates from the processing facility. Residents will be provided compensation for processing of deer/antelope meat samples donated to the project.

Livestock/Wlid Game samples should be ground before storage for pickup and transport to the lab. Fish caught for sampling from Oshoto reservoir will be kept and used for sampling provided that they are of an edible size. Fish will be caught and immediately stored on ice for transport. Only the samples of the edible fish portions will be used in analysis.

8.0 DATA AND RECORDS MANAGEMENT

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC samples are designed to help identify potential sources of sample contamination to evaluate potential error introduced by sample collection and handling. All QA/QC samples are labeled and sent to the laboratory with other samples for analysis. Definitions of QA/QC samples are included in SOP 12, Sample Management.

10.0 REFERENCES

The procedures set forth in this SOP are intended for use with the following SOPs:

- SOP Number 11 Decontamination of Sampling Equipment
- SOP Number 12 Sample Management
- SOP Number 13 Data Management

STANDARD OPERATING PROCEDURE NO. 11
DECONTAMINATION OF SAMPLING EQUIPMENT

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:

SENES Consultants Limited
Englewood, Colorado

December, 2009

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1.0 SCOPE AND APPLICABILITY

This standard operating procedure (SOP) describes procedures that will be used for sampling equipment decontamination. The collection of environmental samples often requires that equipment associated with collecting these samples be cleaned. This requirement reduces the possibility of contaminants being introduced into the sample from external sources and minimizes potential for cross contact of sample media between sampling locations. This procedure establishes the cleaning and decontamination methods for achieving that goal. The need and applicability of this SOP for any specific sampling media (soil, water, etc) will be determined by the Ross Consulting Project Manager

2.0 SUMMARY OF METHOD

3.0 SAFETY

- Hands should be cleaned immediately prior to sample collection and latex gloves worn to ensure that samples are not contaminated.

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the animal tissue sampling program
- Ensuring that all individuals involved with implementing the animal tissue sampling program are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required

- Reviewing data and results from the animal tissue sampling program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment and materials may be used during plant sample collection:

- Chain of Custody forms,
- Contact information for residents providing samples

7.0 PROCEDURE

The meat processing plant/ facility where cattle are taken for slaughter or deer/antelope are taken for processing will be contacted no later than 24 hours of their receiving the animals. A request for a cutting of meat, approximately 18 pounds (8kg) will be requested from edible meat. No liver/blood samples will be taken in this process.

Residents will be provided compensation for beef samples donated based on rates from the processing facility. Residents will be provided compensation for processing of deer/antelope meat samples donated to the project.

Livestock/Wlid Game samples should be ground before storage for pickup and transport to the lab. Fish caught for sampling from Oshoto reservoir will be kept and used for sampling provided that they are of an edible size. Fish will be caught and immediately stored on ice for transport. Only the samples of the edible fish portions will be used in analysis.

8.0 DATA AND RECORDS MANAGEMENT

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC samples are designed to help identify potential sources of sample contamination to evaluate potential error introduced by sample collection and handling. All QA/QC samples are labeled and sent to the laboratory with other samples for analysis. Definitions of QA/QC samples are included in SOP 12, Sample Management.

10.0 REFERENCES

The procedures set forth in this SOP are intended for use with the following SOPs:

- SOP Number 11 Decontamination of Sampling Equipment
- SOP Number 12 Sample Management
- SOP Number 13 Data Management

STANDARD OPERATING PROCEDURE NO. 12
SAMPLE MANAGEMENT

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:
SENES Consultants Limited
Englewood, Colorado
February , 2010

CONTENTS

ATTACHMENTS

1.0 PURPOSE AND SCOPE

The purpose of this document is to define the standard operating procedure (SOP) to be followed in the management of samples for the Baseline Radiological Monitoring Program at the Ross ISR project site.. Included in this SOP are procedures for sample handling, labeling, and documentation for samples taken from groundwater, surface water, air, soil, terrestrial vegetation and biota, sediment and domestic well media.

This SOP presents general information related to sampling, labeling, and preservation and QA/QC methods. The Preoperational Radiological Baseline Sampling and Analysis Plan (SAP) and the media-specific SOPs provide greater detail on these aspects.

1.1 INTRODUCTION AND BACKGROUND

Strata Minerals has defined uranium resources at its Ross project site. As part of the development process, baseline radiological characteristics must be determined for the sites in question. This SOP should be used in the undertaking of environmental sampling for this baseline radiological characterization program.

Sampling is the selection of a portion of a media that is expected to represent the media as a whole. Examination of the sample should identify characteristics of the larger matrix in that location. Therefore, the sampling must be conducted in such a way that ensures that the sample taken is representative of the larger body under investigation to the greatest extent possible. The locations of samples to be taken will ensure that this is the case, and is discussed in more detail in the SAP.

In addition, it is necessary that sampling be conducted so that every sample taken retains its original physical form and chemical composition. Preservation will be used to maintain these facets where necessary as indicated in the SOP for the specific media in question.

2.0 RESPONSIBILITIES

The following sections summarize personnel responsibilities.

CONSULTING PROJECT MANAGER OR SITE MANAGER

The Consulting Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the sampling program.
- Ensuring oversight of all sampling activities.
- Reviewing all sampling activities and documentation to ensure that all such activities are in compliance with the SAP, Environmental Monitoring Program and project-specific work plans.

- Ensuring that all individuals involved in sampling are properly trained in the procedures outlined in this SOP.

2.2 SITE HEALTH AND SAFETY OFFICER

The Site Health and Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during sampling operations.
- Providing the appropriate safety training for the sampling technician(s) as required.

2.3 FIELD TECHNICIAN

Field Technicians are responsible for:

- Adhering to all safety requirements.
- Following the SOP and documenting the appropriate information.
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein).
- Identifying field activities and conditions which do not conform to requirements of this SOP.
- Suspending sampling activities if such activities adversely affect quality or safety.

3.0 PRECAUTIONS

No sampling of hazardous materials is anticipated as part of this sampling program.

Proper labeling of samples, including the date and time that the sample was taken, is critical to ensure that the results can be applied to investigations of the characteristics of the site. Sample labeling is discussed further in Sections 5.0 and 6.0.

Care should be taken in the selection of correct bottle materials and storage conditions to ensure the integrity of the sample. This is discussed further in the media-specific SOPs.

4.0 EQUIPMENT AND MATERIALS

The following equipment will be used for sample management:

- Shipping forms
- Sample containers
- Re-sealable plastic bags

- Ice
- Tape (clear and strapping)
- Scissors/knife
- Cooler/ice chest
- Ice (if necessary)
- Custody seal
- Garbage bags
- Waterproof pens
- Chain of Custody (COC) forms
- Sample labels
- Log book
- Gloves
- Preservative (if necessary)
- Packing material
- Trip blank (as necessary)
- Temperature blank
- Global Positioning System (GPS)

The following forms and supplies will be available as necessary prior to the start of sampling:

- COC forms
- Field log book

This equipment may be in addition to that identified in the media specific SOPs and the SAP.

5.0 PROCEDURES

5.1 TYPES OF SAMPLES

Two types of samples might be required for the completion of this SOP. The specific types of samples will be identified in the media-specific SOPs, and the material given here is for information purposes only.

5.1.1 Composite Samples

Composite samples are samples in which several discrete samples are taken at one time and the samples are homogenized to provide one sample for analysis. Composite samples may be used where averages are acceptable or required, where concentrations are not expected to vary greatly among a media, or where limited sample volumes are available and multiple samples must be combined to provide a sufficient quantity for analysis.

5.1.2 Grab Samples

A grab sample is one in which a discrete portion of the media is taken to be representative of the location as a whole. It is possible that duplicates be taken at that location, but the samples are all taken for independent analysis, and the purpose of the duplicates is to identify error in the analysis or sampling methodology.

5.2 SAMPLE LABELING

All sample labels should be filled out with waterproof ink. Depending on the analysis being completed, sample labels may be provided by the laboratory along with sampling bottles. Solid samples will be collected in jars and liquid samples will be collected in bottles identified for this purpose. Labels may be partially completed prior to the collection of samples in the field. The date, time, sampler's initials and the sample identification number should not be completed until the time of sample collection. Generally, each label shall contain the following information:

- Location name (site name)
- Location identifier (GPS coordinates, refer specifically to the SAP or applicable SOP)
- Sample collection information (grab sample, composite, air filter)
- Date and time of sample collection
- Analysis required
- Preservation methods or materials used
- Sampler's initials
- Filtration (if applicable)
- Sample identification number (see section 6.3)

The following is an example of sample label:

<table>
<tr><td colspan="3">Sample Type:
†Grab †Composite †Other:___________________________________</td></tr>
<tr><td colspan="2">Tests required:</td><td>Preservation used:</td></tr>
<tr><td>Date:</td><td>Time:</td><td>Collected by:</td></tr>
<tr><td colspan="3">Field ID:</td></tr>
<tr><td colspan="3">GPS Location (if available):</td></tr>
<tr><td colspan="3">Additional information:</td></tr>
</table>

More information on determining the sample identification number is provided below.

5.2.1 Sample Identification (ID) Number

The Sample ID number is a unique number that identifies the sample that was taken in the field. It also is referred to as the Field ID number. The Sample ID will be used in all chain of custody forms and documentation relevant to that sample. The ID will be comprised of five components as discussed below.

Component 1

Component 1 is the medium of the sample collected. The table below identifies the nomenclature that should be used for each sample media.

ID	Media
SW	Surface Water
SO	Soil
GW	Groundwater
SED	Sediment
AIR	Air Particulate
DW	Domestic Well
VEG	Terrestrial Vegetation – Plant and Food Crop

MAM	Animal Tissue
RAD	Radon In Air Dosimeters
TLD	Gamma Radiation Dosimeters

Component 2

Component 2 should identify the location at which the sample was taken

Component 3

Component 3 should be the date on which the sample was taken. The format that the date should be recorded in is DDMMYY, for example August 28, 2008 would be 280808.

Component 4

Component 4 is the time that the sample was taken. The format of the time should be recorded in a 24-hour clock format, given to the minute to the extent applicable. For example, 12:15 PM would be recorded as 1215. A time of 8:12 AM would be recorded as 0812.

Component 5

Component 5 is the initials of the person who has taken the sample. Middle initials are not required unless there are two people taking samples with the same first and last initials. Please check with your supervisor if you have any questions regarding the initials to be used.

Example Sample ID

The following is an example of a Sample ID completed using the conventions described above.

SW -280808-1529-SS

Surface Water sample

Sample taken August 28, 2008

Taken at 15:29 or 3:29pm

Stan Smith took sample

5.3 SAMPLE HANDLING

This section discusses proper sample containers, preservatives, and handling and shipping procedures. Some information is provided here as general information, but the media-specific SOPs and SAP should be referred to for specific details on sample handling procedures.

5.3.1 Sample Containers

Certified, commercially clean sample containers shall be obtained from the contracted analytical lab. If appropriate, the bottles shall be labeled by the laboratory to indicate the type of sample to be collected. Required preservatives should be prepared and placed with the bottles for aqueous analysis at the laboratory prior to shipment to the site.

5.3.2 Sample Preservation

As required by specific SOPs, water samples may need to be stored on ice to obtain a temperature equal or lower than 6ºC in an insulated cooler immediately following sample collection. Samples collected during cold seasons may require insulation to prevent the sample from freezing. Consult the media-specific SOP and instructions from the contract laboratory for further direction. Soil and sediment samples do not require preservation. Sample containers for aqueous samples will be obtained from the laboratory containing the appropriate preservatives.

Inorganic samples to be analyzed for radionuclides only are generally not required to be kept at a temperature of 6ºC. Vegetation or other biological samples to be analyzed for radionuclides may need to be kept cold to prevent deterioration of the sample.

5.3.3 Sample Shipping

Sample containers will be placed in re-sealable plastic storage bags and wrapped in protective packaging material (if appropriate). Samples will then be placed in a cooler with ice as necessary (double bagged using plastic trash bags) for shipment to the laboratory. The drain on the cooler will be taped shut. Samples collected in glass containers will be packaged in foam liners and bubble packing or Styrofoam peanuts to ensure that no breakage occurs during shipment. A temperature blank will be included in each cooler as necessary. Samples will be sent to the analytical laboratory as per the method identified by the Consulting Project Manager or Field Manager, using a courier to ensure rapid shipping. Sample shipments will be insured if needed. Shipping receipts should be retained for documentation and sample tracking.

A completed COC form for each cooler will be placed in a re-sealable plastic bag and placed inside of the cooler. A sample COC form is provided in Attachment SOP 12-1. Coolers will be wrapped with strapping tape at two locations to secure the lids. A signed and dated custody seal will be placed on the outside of each cooler in such a manner as to allow detection of tampering (e.g., the seal must be broken to open the cooler). Custody seals will be provided by the Site Manager.

5.4 HOLDING TIME REQUIREMENTS

The holding time is specified as the maximum allowable time between sample collection and analysis and/or extraction, based on the analyte of interest, stability factors, and preservation methods. Allowable holding times, minimum volume and preservation requirements for some radiological analysis parameters are identified in Table 1. (See also specifics in the media specific SOPs). Samples should be sent to the laboratory after collection in sufficient time to allow the laboratory to meet holding time requirements.

5.5 QUALITY CONTROL REQUIREMENTS

Quality control (QC) requirements relevant to analysis of environmental samples will be followed during analytical activities to meet the quality objectives and criteria. Specific QC measures can be found in the media-specific SOPs and the SAP. The purpose of the quality control program is to produce data of known and documented quality that satisfy the project objectives and that meet or exceed the requirements of the standard methods of analysis.

Table 1: Sampling Requirements for Some Radiological Analytes in Water

Analyte	Volume of Sample Required	Container Material	Recommended Preservation	Maximum Recommended Holding Time
Gross alpha/beta	1L minimum	Plastic	Concentrated HNO_3 to pH<2	1 month
Radium-226	1L minimum	Plastic	Concentrated HNO_3 to pH<2	2 months
Radium-228	1L minimum	Plastic	Concentrated HNO_3 to pH<2	2 months
Radon-222	40 mL (VOC vials with gas-tight lid)	Glass, air tight	Cool to 4ºC	As soon as possible
Lead-210	1L minimum	Plastic	Concentrated HNO_3 to pH<2	2 months

5.5.1 QC Samples

A number of QC samples will be used to assess various data quality parameters, such as representativeness of the environmental samples, the precision of sample collection and handling procedures, the thoroughness of the field equipment decontamination procedures, and the accuracy of laboratory analysis. Additional information regarding QC samples and requirements can be found in the media-specific SOPs The Consulting Project Manager , in consultation with the contract analytical laboratory, will determine the QC sampling requirements for specific media.

5.5.2 Laboratory Duplicate

A laboratory duplicate (LD) is prepared by taking an additional aliquot of a sample and preparing and analyzing it in the same fashion as the parent sample. The LD is used to assess the precision of the method due to sample matrix. A minimum of one LD shall be analyzed for every 20 environmental samples of a given matrix.. Analysis of a sample set to assess matrix effects on accuracy and precision is typically dependent on the analyte class (e.g., inorganic vs. organic) and the likelihood of detecting the target analyte.

5.5.3 Field Blank

The field blank for water samples consists of American Society of Testing and Materials (ASTM) Type II reagent grade water supplied by the laboratory that is poured into applicable sample container at the sampling site (in the same vicinity as the associated samples). It is handled in the same manner as the environmental sample and transported to the laboratory for analysis.

Field blanks are used to assess the potential introduction of contaminants from ambient sources (e.g., blowing dirt, gasoline motors in operation, etc.) to the samples during sample collection. The frequency of collection for field blanks shall be a minimum of one field blank for every 20 environmental samples that are collected for organic analyses. Field blanks shall be collected at or near a sample location and if possible, downwind of possible contamination sources.

5.5.4 Trip Blank

The trip blank consists of a small sample vial filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. Trip blanks are not opened in the field. Trip blanks are prepared only when volatile organic compound (VOC – including radon 222 gas) samples are taken and are analyzed only for VOC analytes. Trip blanks are used to assess the potential introduction of contaminants from sample containers or during the transportation and storage procedures. One trip blank should accompany each cooler sent to the laboratory containing samples for analysis of VOCs.

5.5.5 Field Duplicates

A field duplicate sample is a second discrete sample volume collected at the same location as the original sample; homogenization is not performed between the original sample and the field duplicate. Aqueous field duplicate samples are collected from successive volumes from the same sample source and device (e.g., trowel, bucket, etc.). Sediment and soil field duplicates are collected in succession from the same sample source and device. Field duplicate samples are collected using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as field duplicate samples by laboratory personnel performing the analysis.

Field duplicate sample results are used to assess precision of the sample collection process and the heterogeneity of the medium sampled. The frequency of collection for field duplicates is a minimum of one field duplicate sample from each group of 20 environmental samples of a given matrix. Specific locations for collection of field duplicate samples may be designated prior to the beginning of sample collection.

5.6 DOCUMENTATION AND TRACKING

The following sections describe the procedures to be used for documenting and tracking field sampling activities.

5.6.1 Field Notes

Documentation of observations and data acquired in the field will provide information on the acquisition of samples and also provide a permanent record of field activities. The observations and data will be recorded with waterproof ink in a permanently bound weatherproof field logbook with consecutively numbered pages and, if applicable, on field sampling data sheets.

The information in the field logbook will include the following, as a minimum, unless information is recorded on a field sample collection form and that form is cross referenced in the logbook entry. Additional information is included in the specific SOPs regarding the appropriate data sheets.

- Project name
- Location of sample
- Date and time of sample collection
- Sample identification numbers and sample depth (if applicable)
- Description of samples (matrix sampled), composite or grab sample
- Analysis to be performed
- Number and volume of sample containers

- Description of QA/QC samples (if collected)
- Sample methods or reference to the appropriate SOP
- Sample handling, including filtration and preservation, as appropriate for samples
- Field observations
- Results of any field measurements, such as depth to water, pH, temperature, turbidity, and conductivity
- Decontamination information
- Calibration information
- Personnel present
- Method of shipment
- Any deviations from SOPs

If samples are held for an extended period of time (i.e., inadvertently missed Fed-Ex pick up), field personnel will document all sample handling and custody in the field logbook.

5.6.2 Chain of Custody

A record of each sample collected will be kept on a COC form. A given COC form shall not cover samples shipped in multiple coolers. Every sample in a single cooler shall be listed on the COC form accompanying that cooler. The COC form will provide an accurate written record which can be used to trace the custody of all samples from the time of collection through data analyses and reporting. Attachment to this SOP provides an example of an acceptable COC form.

The following will be specified for each sample on the COC form as a minimum:

- Sample number
- Sample date
- Sample time
- Requested analysis
- Number of containers
- Sampler's signature or initials
- Preservation technique
- Sample type (i.e., medium)

The signature of the person relinquishing custody, the date and time that custody was relinquished, the name and address of the laboratory, and the name and phone number of a contact person regarding the shipment also are recorded on the COC.

A sample is considered in custody if it is:

- In one's immediate possession
- In view, after being in physical possession
- Locked so that no one can tamper with it, after having been in physical

custody
- In a secured area

The person responsible for custody of the sample prior to delivery of the samples to the laboratory will sign the COC form, retain the last copy of the three-part COC form, document the method of shipment, send the pink or second copy of the COC to WWC and send the original copy of the COC form with the sample(s) (in a Ziploc bag). Upon receipt at the laboratory, the person receiving the samples will sign the COC form and return the second copy to the Field Manager or Quality Assurance Manager or specified designee. Copies of the COC forms and all custody documentation will be received and kept in the central files. The original COC forms will remain with the samples until final disposition of the samples by the laboratory. The analytical laboratory may dispose of the samples in an appropriate manner 60 to 100 days after data reporting. After sample disposal, a copy of the original COC will be sent to the Field Manager or Quality Assurance Manager or specified designee by the analytical laboratory to be incorporated into the central file

ATTACHMENT 1: EXAMPLE CHAIN OF CUSTODY FORM

Client			**Sample Data**				**Analysis Required**													
Project Number																			**Preservation**	
Sender Name/Signature																		**Comment/Location**		**Preservative/ pH if known**
Sample Number	**Date**	**Time**	**Sample Material Gas (g) Liquid (L) Solid (S)**	**Sample Type**	**Conttainer Glass, Metal, Plastic**	**Number of Containers**														

Relinquished by (signature) **1**	Date	Time	Received by (signature)	Relinquished by (signature) **4**	Date	Time	Received by (signature)
Relinquished by (signature) **2**	Date	Time	Received by (signature)	Received by Laboratory (signature)	Date	Time	Shipping Ticket Number
Relinquished by (signature) **3**	Date	Time	Received by (signature)	Name of Laboratory		Laboratory Control Number	

STANDARD OPERATING PROCEDURE NO. 13
DATA MANAGEMENT

Ross Uranium ISR Project
Crook County, Wyoming

Version 2

Prepared for:
WWC Engineering
Sheridan, Wyoming

Prepared by:
SENES Consultants Limited
Englewood, Colorado

December, 2009

TABLE OF CONTENTS

1.0 SCOPE AND APPLICABILITY

This SOP describes required procedures for data management of the data collected as part of SOP 01 through 10. This SOP describes

- Field data management
- Laboratory data management
- Data backup

2.0 SUMMARY OF METHOD

This standard operating procedure (SOP) describes the data management procedures for all data collected as part of the baseline radiological monitoring of the Ross ISR uranium recovery project.

3.0 SAFETY

4.0 INTERFERENCES

5.0 PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

The following sections summarize personnel responsibilities.

5.1 Project Manager or Site Manager

The Project Manager or Site Manager is responsible for:

- Providing appropriate support and resources to support the data management
- Ensuring that all individuals involved with implementing the data management program are properly trained in the procedures outlined in this SOP

5.2 Project or Site Radiation Safety Officer (RSO)

The Radiation Safety Officer is responsible for:

- Ensuring compliance with radiation safety requirements during all sampling operations
- Providing appropriate radiation safety training for the sampling technician(s) as required
- Reviewing data and results from the animal tissue sampling program to ensure program objectives are being met

5.3 Field Technician

Field Technicians are responsible for:

- Observing all safety requirements
- Following this SOP and completing all required documentation with the appropriate information
- Completing and maintaining quality assurance records (i.e. sample chain of custody forms and logbook entries as specified herein)
- Informing the Project Manager or Site Supervisor of monitoring activities which do not conform to specific requirements, and for carrying out any directions from the Site Supervisor or RSO to address any non-compliant monitoring activities

6.0 EQUIPMENT AND SUPPLIES

The following equipment and materials will be required:

- Field Data Sheets
- Log Books
- In-Situ Rugged Reader
- Chain of Custody forms
- Laboratory Results
- Software
    - Microsoft Office
    - EnviroData
    - WinSitu 5
    - Baromerge
    - Win-Situ Sync

7.0 PROCEDURE

8.0 DATA AND RECORDS MANAGEMENT

9.0 QUALITY ASSURANCE AND QUALITY CONTROL

10.0 REFERENCES

The procedures set forth in this SOP are intended for use with the following SOPs:

- SOP Number 11 Decontamination of Sampling Equipment
- SOP Number 12 Sample Management
- SOP Number 13 Data Management