

<b>Well Sites (Vertical Phase)</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the pad area	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Review Gamma Logs down-hole		Industry Provide	
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Soil Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Water Samples	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Soil Cutting Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec, XRF
	Samples of Mud/Cement	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Control Room Area	Field Survey	N/A	See Note
	“Roughneck” Area	Field Survey	N/A	See Note
	Living Quarters	Field Survey	N/A	See Note
	Food Wagon/Eating Area	Field Survey	N/A	See Note
	Sample around pad perimeter	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
<b>Well Sites (Horizontal Phase)</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the pad area	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta

	Soil Cutting Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec, XRF
	Control Room Area	Field Survey	N/A	See Note
	“Roughneck” Area	Field Survey	N/A	See Note
	Living Quarters	Field Survey	N/A	See Note
	Samples of Mud/Cement	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Food Wagon/Eating Area	Field Survey	N/A	See Note
	Sample around pad perimeter	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec, XRF
	<b>Well Sites (Fracturing Phase)</b>	<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the pad area	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Samples of Sand (Proppant)	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Water Samples [unused frac water]	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Radon-Flaring, Well Pad Area (if accessible)	PADEP radon	Industry container/Lucas cell	Radon Emanation
	Control Room Area	Field Survey	N/A	See Note
	“Roughneck” Area	Field Survey	N/A	See Note
	Living Quarters	Field Survey	N/A	See Note
	Food Wagon/Eating Area	Field Survey	N/A	See Note

<b>Well Sites (Flowback Phase)</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the pad area	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Water Samples (used flow back) [tanks &/or impoundments]	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Sediments	PADEP BOL	1 L Nalgene	Gamma Spec
	Radon-Flaring, Well Pad Area (if accessible)	PADEP radon	Industry container/Lucas cell	Radon Emanation
	Control Room Area	Field Survey	N/A	See Note
	“Roughneck” Area	Field Survey	N/A	See Note
	Living Quarters	Field Survey	N/A	See Note
	Food Wagon/Eating Area	Field Survey	N/A	See Note
	Filter Socks	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
<b>Well Sites (Production Phase)</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the pad area	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Water Samples [Produced Water]	PADEP BoL	4 L cube	gross A/B, Gamma Spec

	Radon-Flaring, Well Pad Area (if accessible)	PADEP radon	Industry container/Lucas cell	Radon Emmination
<b>Wastewater Treatment Plants</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Radon	PADEP radon	EIC or CR	Gamma Spec
	Water Samples [Influent and Effluent]	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Soil/Sediment Samples at discharge	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Sludge / Filter Cake	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Trucks	Field Survey	N/A	See Note
<b>Landfills or On-site Disposal</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Tracking sludge	NA	NA	
	Walkover survey	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Facility Infrastructure	Field Survey	N/A	See Note <sup>1</sup>
	Soil Samples	PADEP BoL	1 L Nalgene	gross A/B

	Leachate Samples	PADEP BoL	4 L cube	Gross A/B, Gamma Spec, H- 3
	Rock Cutting Samples (If available)	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	<b>Beneficial Use</b>	<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey / Drive-Over	GPS/GPS Array	N/A	Gross Gamma
	Road Survey	GPS Array	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Soil Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Sediment Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Brines (If available)	PADEP BoL	1 L Nalgene	Gamma Spec
	<b>Oil &amp; Gas Permit 071 Operations</b>	<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Influent Water	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Effluent Water	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Tanks	PADEP BoL	4 L cube	gross A/B, Gamma Spec
	Filters	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Residues	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Sludge	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec
	Product	PADEP BoL	4 L cube	gross A/B, Gamma Spec

	Trucks	Field Survey	N/A	See Note
<b>Gas Production, Distribution and Use</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Facility walkthrough	Field Survey	N/A	See Note
	Piping, valves, manifolds, etc.	Field Survey	N/A	See Note
	Processing equipment	Field Survey	N/A	See Note
	Tanks	Field Survey	N/A	See Note
	Gas Samples (where available)	Radon	Industry container/Lucas cell	Radon Emanation
	Ambient air sampling	Radon	Passive Charcoal	Radon Emanation
<b>Well Component Reconditioning Facilities</b>		<b>Equipment</b>	<b>Sample Container</b>	<b>Analysis</b>
	Walkover survey and sketch of the facility	GPS/2221 w/44-10	N/A	Gross Gamma
	Background survey	All instruments used	N/A	Gross A/B/G
	Gamma exposure	MicroRem	N/A	Gross Gamma
	Alpha/Beta Survey	2360 - 43-89	N/A	Gross Alpha / Beta
	Scale Samples	PADEP BoL	1 L Nalgene	Gamma Spec, Alpha Spec

Note: "Field Surveys" represent smears, exposure rates, total alpha/beta measurements where applicable.

<b>Facility Type</b>	<b>Estimated No. of Facilities</b>	<b>Estimated Total # Samples / Round</b>	<b>Estimated Total # of Smears for Study</b>	<b>Estimated Total #of Solids for Study</b>	<b>Estimated Total # of Liquids for Study</b>
Well Sites (Vertical)	7	21	350	21	0
Well Sites (Horizontal)	4	12	200	12	0
Well Sites (Fracturing)	7	91	350	0	84
Well Sites (Flowback)	7	42	350	7	28
Well Sites (Production)	7	91	210	0	84
Wastewater Treatment Plants	23	207	2760	276	276
Landfills	9	18	180	9	9
Beneficial Use	4	24	0	8	16
Oil & Gas Permit 071 Operations	4	20	10	4	16
Gas Production, Distribution and Use	9	29	90	9	8
Well Component Reconditioning Facilities	1 (or more)	12	50	10	0
<b>Totals</b>	<b>82</b>	<b>522</b>	<b>4550</b>	<b>356</b>	<b>509</b>