

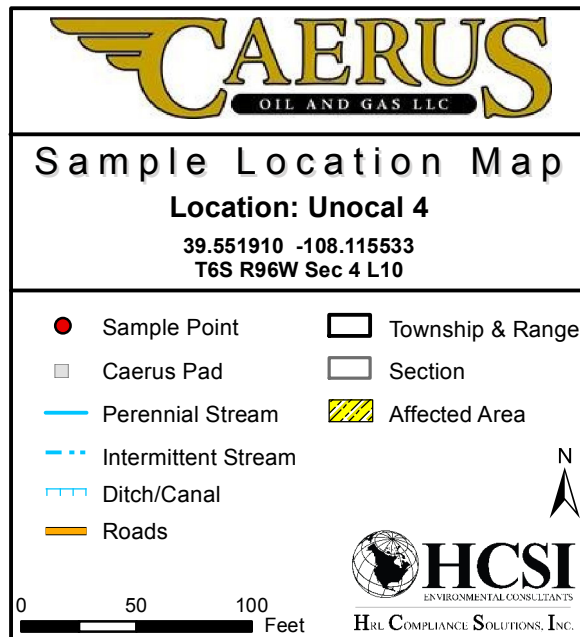
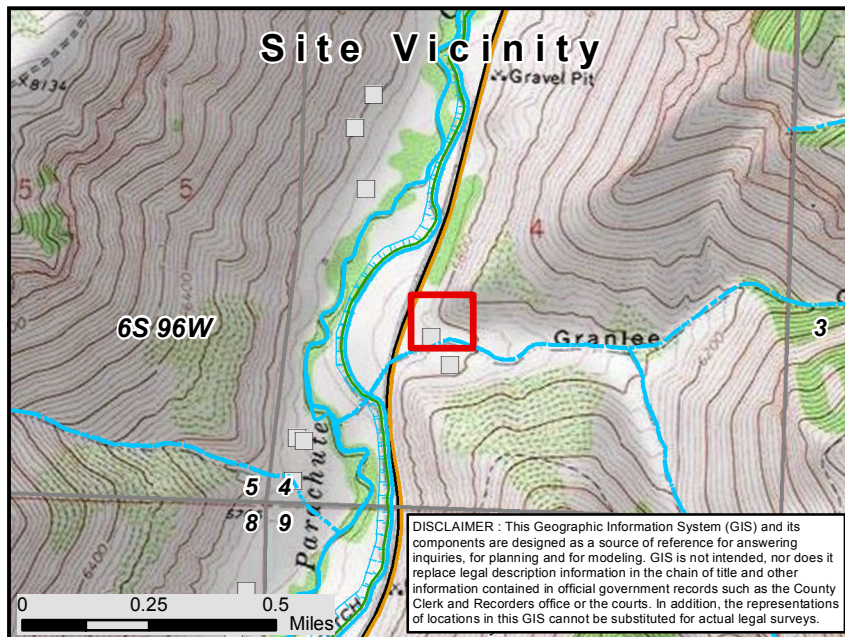
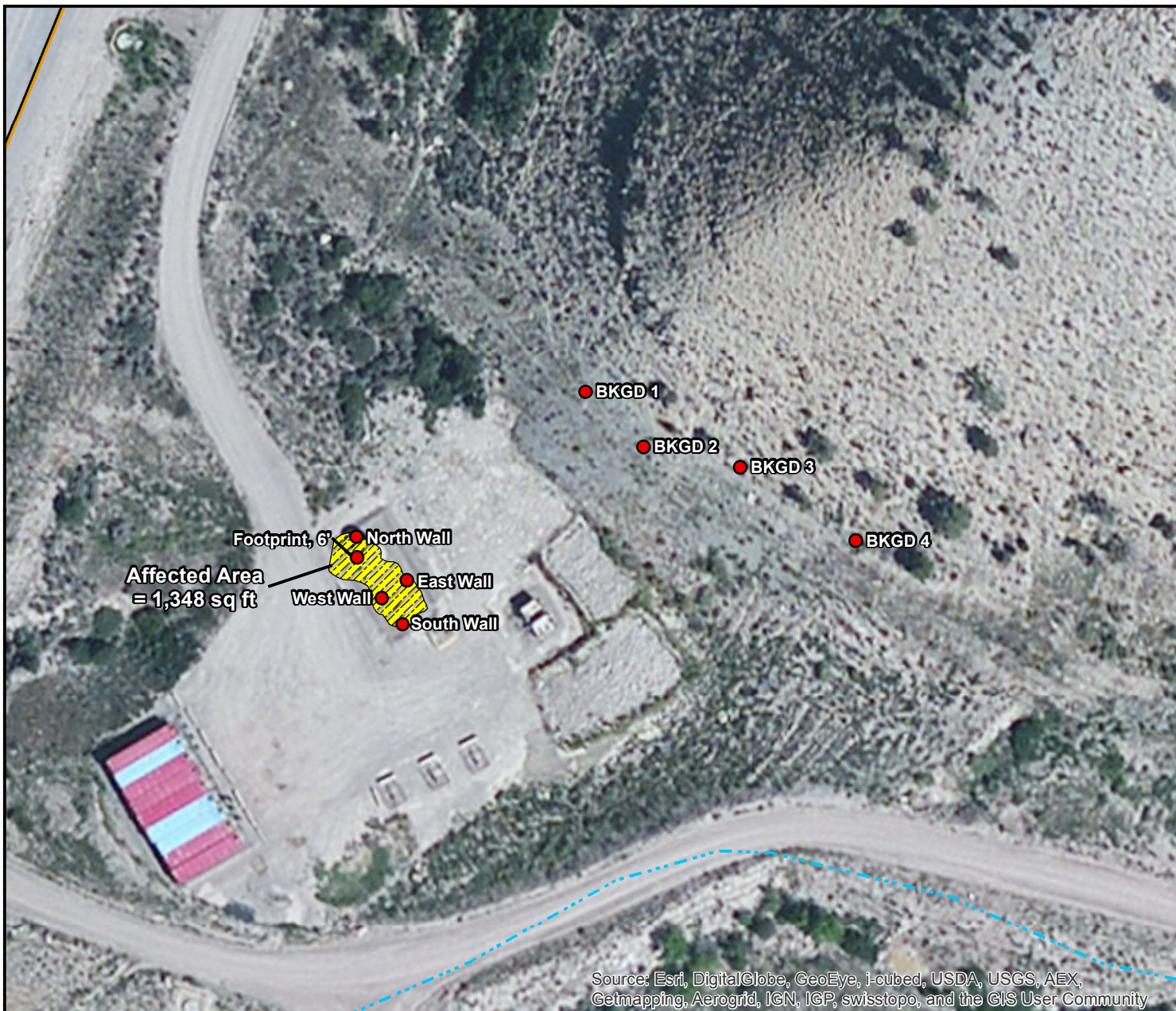
**Unocal 4 (Unocal 23-4D) (Location ID 335778)**  
**Partially Buried Vessel Removal (Non-Facility ID 435782)**  
**Report of Work Done/Project Update**  
**Document Date – 4/9/2015**

This Project Update was prepared for the purpose of describing completed work associated with the assessment of impacted soil discovered during the removal of a partially buried vessel (PBV) (Non-Facility ID 435782) at the Unocal 4 (Unocal 23-4D) (Location ID 335778) pad location in the Caerus Piceance, LLC (Caerus) area of operations. This assessment was conducted using procedures approved under COGCC Remediation #8164. A Sample Location Map is included as an attachment to this form.

Upon removing the PBV from the ground, field screen readings from around and below the tank revealed contaminant levels above COGCC Table 910-1 Concentration Levels. Excavation of the impacted soil was conducted and field screen readings were utilized to determine the extent of the impacts.

On November 26, 2013, confirmation soil samples were collected from the soil within the excavated area (North Wall, 3', Footprint, 6', West Wall, 3', East Wall, 3', and South Wall, 3'). Soil samples were submitted for laboratory analysis of all COGCC Table 910-1 analytes. Laboratory analytical results indicate all soil samples were in compliance with COGCC Table 910-1 Concentration Levels for all analytes or were within the arsenic range allowed by the COGCC (1.25x background concentration). A background sample from a nearby pad (Chevron 41-8D, COGCC Location ID 324196) was used for comparison. Sample locations are depicted on the attached Sample Location Map and laboratory analytical results are summarized in the attached analytical table.

All impacted soil removed during excavation activities is currently being remediated on site in a landfarm with a containment berm. On March 20, 2014, a composite soil sample (Containment Cell) was collected from the landfarm and submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Analytical results indicated that the soil sample exceeded COGCC Table 910-1 Concentration Levels for all analytes except for ethylbenzene. On June 26, 2014, an additional composite soil sample (Containment Cell) was collected from the landfarm and submitted for laboratory analysis of TPH and BTEX. Analytical results indicated that the soil sample exceeded COGCC Table 910-1 Concentration Levels for TPH but was compliant with levels listed for BTEX. The impacted soil was stirred and agitated on April 1, 2015 in order to promote volatilization of the existing hydrocarbons. A composite soil sample will be collected from the landfarm in late April 2015 and submitted for laboratory analysis of TPH. If the TPH concentration is compliant with COGCC Table 910-1 Concentration Levels, the sample will be analyzed for the remaining analytes listed in COGCC Table 910-1. Laboratory analytical results are summarized in the attached analytical table.





Caerus Piceance LLC  
Unocal 4 Partially Buried Vault Removal  
Soil Sample Confirmation and Background Analytical Results

			Sample ID											
COGCC Table 910-1 Analytical Suite	Table 910-1 Standard	Units	North Wall, 3'	South Wall, 3'	East Wall, 3'	West Wall, 3'	Footprint, 6'	Containment Cell	Containment Cell	BKGD 1	BKGD 2	BKGD 3	BKGD 4	BKGD 1*
Sample Date			11/26/2013	11/26/2013	11/26/2013	11/26/2013	11/26/2013	3/20/2014	6/26/2014	12/7/2012	12/7/2012	12/7/2012	12/7/2012	7/22/2013
Organics														
TPH (DRO)	500	mg/kg	22	30	14	14	50	2,400	2,900	NS	NS	NS	NS	NS
TPH (GRO)	500	mg/kg	10	ND	ND	ND	ND	2,400	3,900	NS	NS	NS	NS	NS
TPH	500	mg/kg	32	30	14	14	50	4,800	6,800	NS	NS	NS	NS	NS
BENZENE	0.17	mg/kg	ND	ND	ND	ND	ND	4.3	ND	NS	NS	NS	NS	NS
TOLUENE	85	mg/kg	0.042	ND	ND	ND	ND	94	0.52	NS	NS	NS	NS	NS
ETHYLBENZENE	100	mg/kg	ND	ND	ND	ND	ND	18	ND	NS	NS	NS	NS	NS
XYLENE TOTAL	175	mg/kg	0.22	ND	ND	ND	ND	290	100	NS	NS	NS	NS	NS
ACENAPHTHENE	1,000	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
ANTHRACENE	1,000	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
BENZO(A)ANTHRACENE	0.22	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
BENZO(A)PYRENE	0.022	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
BENZO(B)FLUORANTHENE	0.22	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
BENZO(K)FLUORANTHENE	2.2	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
CHRYSENE	22	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
DIBENZO(A,H)ANTHRACENE	0.022	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
FLUORANTHENE	1,000	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
FLUORENE	1,000	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
INDENO(1,2,3-CD)PYRENE	0.22	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
NAPHTHALENE	23	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
PYRENE	1,000	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
Metals														
MERCURY	23	mg/kg	0.019	0.041	0.021	0.023	0.020	NS	NS	NS	NS	NS	NS	NS
ARSENIC	0.39	mg/kg	21	16	22	26	21	NS	NS	6.5	8.5	5.5	9.7	39
BARIUM	15,000	mg/kg	630	300	320	360	370	NS	NS	NS	NS	NS	NS	NS
CADMIUM	70	mg/kg	ND	ND	ND	1.0	ND	NS	NS	NS	NS	NS	NS	NS
CHROMIUM (III)	120,000	mg/kg	18	17	20	22	24	NS	NS	NS	NS	NS	NS	NS
CHROMIUM (IV)	23	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
COPPER	3,100	mg/kg	23	19	23	28	26	NS	NS	NS	NS	NS	NS	NS
LEAD	400	mg/kg	18	18	18	20	19	NS	NS	NS	NS	NS	NS	NS
NICKEL	1,600	mg/kg	21	17	25	32	27	NS	NS	NS	NS	NS	NS	NS
SELENIUM	390	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
SILVER	390	mg/kg	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
ZINC	23,000	mg/kg	64	56	64	74	64	NS	NS	NS	NS	NS	NS	NS
Inorganics														
Sodium Absorption Ratio	<12	unitless	3.9	1.1	1.0	1.4	4.4	NS	NS	NS	NS	0.67	NS	NS
Electric Conductivity	<4mmhos/cm or 2x background	mmhos/cm	2.6	0.80	0.92	0.95	1.6	NS	NS	NS	NS	2.60	NS	NS
pH	6 to 9	SU	8.6	8.2	8.5	8.7	8.6	NS	NS	NS	NS	8.48	NS	NS

Notes:  
\* This background sample was collected near another pad location, Chevron 41-8D (COGCC Location ID 324196)  
highlight indicates reading above COGCC Table 910-1 standards  
ND - non detect  
NA - not analyzed  
SU - standard unit  
mg/kg - milligram per kilogram  
mmhos/cm - millimhos per centimeter  
TPH (DRO) - total petroleum hydrocarbons - Diesel range organics  
TPH (GRO) - total petroleum hydrocarbons - gasoline range organics  
TPH - total petroleum hydrocarbons (TPH-GRO and TPH-DRO combined)  
COGCC - Colorado Oil and Gas Conservation Commission