

## Appendix A

The tables that follow the text below contain the analytes that will be sampled in accordance with this Memorandum.

### Regarding LA/Pueblo Canyon Telemetry:

1. Telemetry used to communicate flow data from the gaging stations to the BDD shall be designed to provide a received signal level at each receiver with a fade margin of no less than 25 dBm above the equipments receiver threshold. Telemetry equipment shall include battery backup sized to provide a minimum 12 hour operation after failure of primary power. Battery run time shall be calculated in a mode of operation consistent with frequent data transmission during a slow event.
2. LA/P Canyon flow confirmation at the E110 gauging station: [This section contingent on Pueblo de San Ildefonso review and approval]
3. The amount of time between a station trigger and when notification is available to the BDD Project will be as short as is practical, with a goal not to exceed 1 minute.

### Regarding LA/Pueblo Canyon water quality sampling:

1. The goals of the sampling strategy are to collect data that represent variations in contaminant concentrations and suspended sediment concentration (SSC) within runoff events across a typical hydrograph for each location (Monitoring Plan for LA/P Canyon Sediment Transport Mitigation Project (LA-UR-09-6563)).
2. Each of the gages will be monitored continuously for stage. Samples at E050, E060, and E110 will be triggered by 5-cfs flows to ensure sampling at flows that may extend to the Rio Grande (Monitoring Plan for LA/P Canyon Sediment Transport Mitigation Project (LA-UR-09-6563)).
3. Prioritization of analytes if water volume is insufficient to fulfill suite: PCBs, gamma spec, iso pu, Sr-90, dioxin/furans, target analyte list metals, gross alpha, iso u, Am-241 (alpha spec), SSC
4. E110 will be analyzed for filtered and unfiltered TAL Metals and radionuclides.
5. All event exceeding 5 cfs at E050, E060 and E110 will be analyzed for the following parameters.

### Regarding Rio Grande at Buckman Sampler:

The sampler will have functionality sufficient to receive a telemetry signal from early warning and operator triggered, stage & flow actuator, flowlink software, datalogger, and the ability to integrate a parallel NMED sampler.

The BDD Board and DOE agree to apply for and utilize a DOE grant to fund the maintenance, inspection, repair and replacement of the Rio Grande at Buckman sampler described above in this Appendix and in the Memorandum of Understanding. If such a grant is not available by October 1, 2010 then DOE agrees to install, implement and operate this sampler. Furthermore, and until the Rio Grande at Buckman sampler is operational, DOE agrees to equip the existing NMED sampler located at Buckman with the capability to receive a telemetry signal from the E110 gage as soon as practical following the execution of this MOU. The BDD Board will be responsible for all permit requirements and will provide DOE with a statement of work and a cost estimate for the sampler by June 1, 2010.

Regarding all detection limits in the analyte tables that follow:

Values will be reviewed at the first Biannual Review meeting, using the following principles: Method reporting limits for sample analyses for each medium shall be established at the lowest level practicable for the method and analyte concentrations and shall not exceed soil, groundwater, surface water, or vapor emissions background levels, cleanup standards, and screening levels. The preferred method detection limits are a maximum of 20 percent of the background, screening, or cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air emissions cleanup standards, screening levels, or background levels and are reported as "not detected" shall be considered data quality exceptions and an explanation for the exceedance and its acceptability for use shall be provided. (section IX.C.3.c Method Reporting Limits from the Consent Order).

**Table 1: Standard Operating Procedures for the  
 BDD/DOE Memorandum of Understanding**

SOP Number/Title	Application			
	Stream Gage/Sampler Maintenance	LA/P Canyon Storm Water Quality Sampling	Rio Grande at BDD Project Location Sampling	Rio Grande Contaminant Fate Analysis
<b>LANL Procedures</b>				
SOP-5213 Collecting Storm Water Runoff Samples and Inspecting Samplers <sup>1</sup>	✓	✓		
SOP-5214 Installation, Setup, and Maintenance of ISCO Samplers		✓		
SOP-5215 Processing Storm Water Samples		✓		
EP-ERSS-SOP-5057 Handling, Packaging and Transporting Field Samples		✓		
SOP-5255 Shipping of Environmental Samples by the WES Sample Management Office (SMO)		✓		
ENV-WQH-SOP-009.3 Operation and Maintenance of Stream Gaging Stations	✓			
<b>BDD Procedures</b>				
BDD SOPs			✓	✓

<sup>1</sup>Or equivalent SOP used by DOE contracted sampling subcontractors.

**Table 2: Los Alamos/Pueblo Canyon Storm Water Quality Sampling**

<b>Analytes</b>	<b>Method</b>	<b>Detection Limit</b>	<b>Field Prep Code</b>
SSC	EPA:160.2	3 mg/L	UF
TAL metals (23), plus Hg	EPA:200.7, EPA: 200.8, EPA:245.2	0.2 – 300 mg/L	F, UF
hardness	SM:A2340B	2 mg/L	UF
Gross alpha	EPA:900	3 pci/L	F, UF
Gross beta	EPA:900	3 pci/L	F, UF
Sr-90	EPA:905.0	0.5 pci/L	F, UF
Am-241	HASL-300:AM-241	0.05 pci/L	F, UF
Gross gamma	EPA:901.1	15 pci/L	F, UF
Cs-137	EPA:901.1	5 pci/L	F, UF
Co-60	EPA:901.1	5 pci/L	F, UF
Na-22	EPA:901.1	10 pci/L	F, UF
Np-237	EPA:901.1	40 pci/L	F, UF
K-40	EPA:901.1	75 pci/L	F, UF
Pu (isotopic)	HASL-300:ISOPU	0.05 pci/L	F, UF
U (isotopic)	HASL-300:ISOU	0.05 pci/L	F, UF
dioxin-furans	SW-846:8290	0.2 – 0.5 pg/L	UF
PCBs	EPA 1668A-Congener Method	20 – 150 pg/L	UF
Ra-226 & -228	EPA:903.1 & EPA:904.4	1 pci/L	F, UF

**Table 3: Rio Grande at BDD Project Location Sampling Program**

Analytes	Method	Detection Limit	Field Prep Code
Gross alpha	EPA:900	3 pci/L	F, UF
Gross beta	EPA:900	3 pci/L	F, UF
Sr-90	EPA:905.0	0.5 pci/L	F, UF
Am-241	HASL-300:AM-241	0.05 pci/L	F, UF
Gross gamma	EPA:901.1	15 pci/L	
Cs-137	EPA:901.1	5 pci/L	F, UF
Co-60	EPA:901.1	5 pci/L	F, UF
Na-22	EPA:901.1	10 pci/L	F, UF
Np-237	EPA:901.1	40 pci/L	F, UF
K-40	EPA:901.1	75 pci/L	F, UF
Pu (isotopic)	HASL-300:ISOPU	0.05 pci/L	F, UF
U (isotopic)	HASL-300:ISOU	0.05 pci/L	F, UF
Ra-226, -228	903.1, 904	1 pci/L	F, UF
TAL metals (23), plus Hg	EPA:200.7, EPA: 200.8, EPA:245.2	0.2 – 300 mg/L	F, UF
TDS	EPA:160.1	10 pci/L	F
TOC	SW-846:9060	1 mg/L	UF
SSC	EPA:160.2	3 mg/L	UF
dioxin-furans	SW-846:8290	0.2 – 0.5 pg/L	UF
PCBs	SW-846:8082	0.2 ug/L	UF
PCBs	EPA 1668A-Congener Method	20 – 150 pg/L	UF
PADS-particle size analysis	ASTM C-1070-01	0.1 %	UF
perchlorate	SW846 6850 Modified	0.2 mg/L	UF

**Table 4: Rio Grande Contaminate Fate Analysis**

<b>Analytes</b>	<b>Method</b>	<b>Detection Limit</b>	<b>Field Prep Code</b>
Gross alpha	EPA:900	3 pci/L	F, UF
Gross beta	EPA:900	3 pci/L	F, UF
Sr-90	EPA:905.0	0.5 pci/L	F, UF
Am-241	HASL-300:AM-241	0.05 pci/L	F, UF
Gross gamma	EPA:901.1	15 pci/L	F, UF
Cs-137	EPA:901.1	5 pci/L	F, UF
Co-60	EPA:901.1	5 pci/L	F, UF
Na-22	EPA:901.1	10 pci/L	F, UF
Np-237	EPA:901.1	40 pci/L	F, UF
K-40	EPA:901.1	75 pci/L	F, UF
Pu (isotopic)	HASL-300:ISOPU	0.05 pci/L	F, UF
U (isotopic)	HASL-300:ISOU	0.05 pci/L	F, UF
Ra-226, 228	903.1, 904	1 pci/L	F, UF