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ExxonMobil Environmental Services Company

October 2011 Downstream Sediment Sampling Data Summary Report

Silvertip Pipeline Incident Response

Laurel, Montana

March 2012

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A October 2011 Downstream Sediment Sampling Field Notes

1. Introduction

This October 2011 Downstream Sediment Sampling Data Summary Report (Data Report) has been prepared by ARCADIS for ExxonMobil Environmental Services Company (EMES) on behalf of ExxonMobil Pipeline Company (EMPCo) and describes the sediment and surface water sampling activities conducted from October 26 through November 2, 2011. This sampling was conducted to further characterize the sediment and surface water quality in the Yellowstone River (the river) downstream of the Silvertip Pipeline Incident, which occurred in Laurel, Montana. Specifically, this sampling program was implemented in response to the October 19, 2011 letter from Montana Department of Environmental Quality (MDEQ; MDEQ 2011), which requested that sediment samples be collected from 27 locations, as specified by MDEQ. The approach and sampling methods used to address MDEQ's request was outlined in EMES's October 23, 2011 response letter (EMES 2011), and the Downstream Impacted Areas Soil and Sediment Sampling Plan (ARCADIS 2011a).

Samples collected during this program were located on targets identified by MDEQ and additional locations identified by EMES on a voluntary basis. Samples were collected from locations where sediments may have been deposited during and following the flood conditions following the July 1, 2011 Silvertip Pipeline Incident and were advanced to a depth of 1.5 feet, or less, if refusal was encountered. Because the river stage at the time of sampling was approximately 10 to 12 feet below the stage at the time of the Silvertip Pipeline Incident, the samples collected were above the water line at the time of sampling.

Implementation of the October 2011 Sediment Sampling Program resulted in collection of 56 sediment samples and nine surface water samples. Details regarding the purpose and objectives of the sampling program are described in Section 1.1. Discussion of sediment and surface water data are provided in Section 2.

1.1 Purpose and Objectives

This report describes sampling field activities completed by ARCADIS from October 26 through November 2, 2011, as well as laboratory analytical data for the samples collected during field activities.

MDEQ's requested sampling program was based on their concern that crude oil may have been deposited in sediments at depths greater than 6-inches, and the oil may have been entrained or trapped near and under woody debris piles. Twenty-seven

target sediment sample locations were identified by MDEQ in the October 19, 2011 letter.

The basis for the selected sample locations included:

- Sixteen locations where sheen was observed on water were identified by a PhD student during fisheries fieldwork. Note, one location was not sampled due to its proximity to ExxonMobil Corporation's Billings refinery and a second location was not sampled because property access could not be obtained.

- Three locations were identified at woody debris piles where oily sediments may have accumulated.

- Eight of the 27 locations were identified at gravel bars and islands with sampling depths of up to 8 feet deep to investigate the potential for crude oil trapped at depth within the gravel deposits. Sampling at these locations was not implemented for the reasons described in EMES's October 23, 2011 response letter.

Eight additional voluntary sample locations were identified by EMES based on the following:

- One area was selected because a sheen was observed at two water-filled depressions on an island/gravel bar. Sampling locations were selected based on field observations; there were a total of five sample locations in this area.

- Three locations were selected to verify analytical sample results for previous sediment samples as reported in the Downstream Soil and Sediment Data Summary Report (ARCADIS 2011b). These previous sediment sample results had detections of benzene, toluene, ethylbenzene, and xylenes (BTEX; one location) or total extractable hydrocarbon (TEH) results above 200 milligrams per kilogram (mg/kg) (USEPA 2006; two locations) from samples collected during the Downstream Soil and Sediment Sampling Program or by MDEQ (ARCADIS 2011b).

Samples were collected to 18 inches below sediment surface (bss) or refusal (whichever occurred first) from each of these 25 locations. At the woody debris pile locations and the location where sheen was observed at the two water-filled depressions, additional sediment samples were collected in attempt to delineate the lateral and vertical extent of oiled sediment. Therefore, a total of 29 locations were sampled, and 56 sediment samples were collected. As the riverbed has many cobbles

and pieces of debris, not all locations were completed to the full 1.5-foot sample depth because of refusal at a shallower depth. Total sample depths are as follows:

- At 12 locations, refusal was met between 3 to 7 inches bss. At each of these locations, one sample was collected from the surface to the depth of refusal.
- At five locations, refusal was met between 10 to 11 inches bss. At each of these locations, two samples were collected: one from 0 to 6 inches bss, and the other from 6 inches bss to the depth of refusal.
- At five locations, refusal was met at 12 inches bss. At each of these locations, two samples were collected: one from 0 to 6 inches bss, and the other from 6 to 12 inches bss.
- At seven locations, the full 18-inch sample depth was achieved. At each of these locations, three samples (0 to 6 inches bss, 6 to 12 inches bss, and 12 to 18 inches bss) were collected.

At all locations, if a sheen was observed during probing or disturbance of sediments, a surface water sample was also collected. Surface water samples at three locations (six surface water samples total) were collected on this basis. A seventh surface water sample was collected upstream from where sheen was observed in an attempt to delineate the area.

Sample IDs, location coordinates, and the purpose of the sample (e.g., woody debris pile, sheen observations) are presented in Table 1.

The objectives of this report are to:

- Document the field and analytical procedures used during implementation of sediment and surface water sampling.
- Present the analytical results of the sediment and surface water samples.
- Screen the sediment and surface water analytical results against benchmark values, as described in Downstream Impacted Areas Soil and Sediment Sampling Plan (ARCADIS 2011a).

1.2 Site Setting and Conditions

On July 1, 2011, there was a release of crude oil from the Silvertip Pipeline located near Laurel, Montana. EMPCo activated its Emergency Response Plan to provide a rapid and comprehensive response to the incident. An Incident Action Plan was developed, and an Incident Command System (ICS) organization and Unified Command (UC) were established to manage the release response activities in a coordinated manner with the multiple stakeholders involved, including the MDEQ and U.S. Environmental Protection Agency (USEPA). Activities associated with the emergency response phase of the project were completed by October 31, 2011.

The Silvertip Pipeline Incident site (site) is located near Laurel, Montana and downstream along the Yellowstone River, which originates in northwest Wyoming and flows northeast through Montana to its confluence with the Missouri River near Buford, North Dakota (Figure 1). During the sampling activities conducted by ARCADIS from October 26 through November 2, 2011, river flow at Billings, Montana (U.S. Geological Survey [USGS] gage 06214500) ranged from 4,330 to 4,700 cubic feet per second (cfs), corresponding to river stages between approximately 3.35 and 3.51 feet (gage datum, 3,080 feet National Geodetic Vertical Datum of 1929 [NGVD 29]). These river flow and stage conditions were below the annual median river flow of approximately 6,600 cfs, and the average river stage of approximately 5 feet gage datum.

2. Sediment Investigation

The sediment investigation activities were performed by ARCADIS on behalf of EMPCo from October 26 through November 2, 2011. The following sections present the scope of work completed and the field and laboratory data collected during these activities, along with the results of screening sediment and surface water data against benchmark values.

2.1 Sample Location Selection

As discussed in Section 1.1, target sample locations were identified by MDEQ and EMES. Before sampling, each location was confirmed to have utility clearance as well as access permission to the sample location from the property owner. One target sample location identified by MDEQ could not be accessed because it was located on a property for which the property owner would not grant access. As a sample was not collected at this location, it does not have a sample identifier, but the location is shown on Figure 9.

All sediment sampling activities were overseen by an on-site MDEQ representative. The MDEQ representative provided guidance for selecting the sample locations and approved the locations sampled as representative of the conditions targeted for sampling. In general, sediment sample locations were selected in the field based on proximity to the target location and presence of fine-grained sediment.

At each sediment sample location, field teams scouted the area near the target coordinates to identify areas where evidence of fine-grained sediment was observed. Probing of the target sediments was performed with rebar to determine the thickness of the fine-grained sediment deposits at the target sample location. Due to low river water levels, not all target-sampling locations were adjacent to water. At locations where water was present, submerged sediments were probed to identify the presence or absence of sheen. At locations where sheen was observed and surface water samples were collected, absorbent pads were used to prevent release and transport of sheen in the river. A summary of sampling locations and the rational for selecting sampling locations is provided below.

- MDEQ Sheen on Water Locations – 16 locations were originally identified; however, as noted above, samples were only collected from 14 locations. A total of 35 sediment samples and two surface water samples were collected from these 14 locations (see Figures 5 and 7 through 10). Surface water samples

BIMT1031SW101 and BIMT1031SW102 were collected from backwater, low-flow areas of the Yellowstone River (see Figure 10). There were no submerged fine-grained sediments where the surface water sample was collected, therefore sediment samples were collected from adjacent areas (i.e., not submerged at the time of sampling) using hand auger methods.

- MDEQ Woody Debris Locations – Three woody debris locations were identified and a total of 11 sediment samples and 3 surface water samples were collected at these locations (see Figures 3 through 5). Surface water samples LAMT1101SW101 and LAMT1101SW102 were collected from backwater, low-flow areas of the Yellowstone River and LAMT1101SW103 was collected from a deep water area in the river (see Figure 3). At the woody debris pile where surface water sample LAMT1101SW101 was collected, sheen was observed; however, only one sediment sample (LAMT1101SE104) was able to be collected in the area as a result of fast moving water. Sheen was observed slightly downstream of LAMT1101SW101 and surface water sample LAMT1101SW102 was collected. As a result of the fast moving water, it was unsafe to collect a sediment sample at LAMT1101SW102. Surface water sample LAMT1101SW103 was collected slightly upstream of LAMT1101SW101. The area was probed for evidence of sheen; however, no sheen was observed. In addition to the fast moving water, the area also lacked fine-grained sediments further restricting the collection of a sediment sample.

- EMES Voluntary Locations: Water Filled Depression – Six sediment samples and two surface water samples were collected from an area surrounding two water-filled depressions on an island/gravel bar adjacent to but isolated from the river (see Figure 6). Similar to the surface water samples collected from the MDEQ Sheen on Water Location, there were no submerged fine-grained sediments where the surface water sample was collected. As such, sediment samples were collected from adjacent areas (i.e., not submerged at the time of sampling) using hand auger methods.

- EMES Voluntary Locations: Verification of Analytical Results – Three locations were voluntarily sampled by EMES to verify the analytical results of previously collected sediment samples (see Figures 2 and 5). A total of four sediment samples were collected at these three locations. There were no observations of sheen at these locations, and therefore no surface water samples were collected.

Field teams documented the conditions observed at each sample location, highlighting the presence or absence of oiling/sheen, vegetation, debris, erosion, or other effects of flooding at the location.

Location coordinates for sediment sample locations were recorded using a handheld global positioning system (GPS) with accuracy greater than +/- 3 feet and are tabulated in Table 1. On Figures 2 through 10, sediment sample locations are indicated by the letters “SE” or “SD” in the sample ID. Surface water samples collected at locations where sheen was observed are indicated by the letters “SW” in the sample ID.

2.2 Sampling Methodology

The following sections describe the sediment and surface water sampling methodology.

2.2.1 Sampling Plan and Process

After sample locations were identified, samples were collected in accordance with the Downstream Impacted Areas Soil and Sediment Sampling Plan (ARCADIS 2011a) and the Surface Water and Sediment Sampling Standard Operating Procedures (SOPs; CTEH 2011a).

2.2.1.1 Surface Water Sampling

At locations where sheen was observed, a surface water sample was collected prior to collecting a sediment sample. Surface water was collected by dipping a dedicated jar into the river at the target sampling location, and skimming the surface water to capture the visible sheen. Water from the dedicated jar was transferred into laboratory-provided sample containers for the following analytical suite:

- Extractable petroleum hydrocarbons (EPH) screen by MT Modified Massachusetts Method
  - If EPH screen produced a TEH value greater than 1,000 parts per billion (ppb), then the following were also analyzed and reported:
    - EPH fractions by MT Modified Massachusetts Method
    - Polynuclear aromatic hydrocarbons (PAHs) via method 8270-SIM
- Volatile petroleum hydrocarbons (VPH) by MT Modified Massachusetts Method
- Total suspended solids (TSS) by Standard Method 2540D

2.2.1.2 Sediment Sampling

A decontaminated hand auger was used to collect up to three discrete sediment samples, from 0 to 6 inches bss, 6 to 12 inches bss, and 12 to 18 inches bss.

Refusal occurred at nine locations at less than the shallowest 6 inch bss target sample depth. In each case where refusal occurred, MDEQ confirmed that appropriate and sufficient methods and efforts to achieve the target sample depth were used and approved collection of the samples at the depths achieved.

Each sediment sample was screened visually and using photoionization detector (PID) measurements for indications of potential crude oil impacts. Sediments were logged in accordance with Unified Soil Classification System (USCS) ASTM standards. Additional observations such as color, type of organic materials present, odor, and sheen and staining, if present, were recorded. Sediment sample USCS classifications are presented in Table 2.

Sediment samples were submitted to Pace Analytical Laboratory, located in Billings, Montana (Pace Lab) for the following analytical suite:

- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C
- PAHs by 8270 SIM
- EPH Screen by EPH Massachusetts Method (MT Modified)
  - If the EPH screen produced a TEH value greater than 200 mg/kg, the sample was analyzed for EPH fractions
- VPH by VPH Massachusetts Method (MT Modified)
- Total organic carbon (TOC) by EPA Method M9060

Sediment samples are presented in Table 3.

2.3 Sediment Sample Data Quality

Field activities were completed in accordance with quality assurance/quality control (QA/QC) procedures, as outlined in the Quality Assurance Project Plan for Comprehensive Sampling and Analysis Plan (QAPP; CTEH 2011b).

Field quality control samples were collected during implementation of the October 2011 Sediment Sampling Program, in accordance with the QAPP. Two matrix spike and matrix spike duplicate (MS/MSD) samples and two blind duplicate (BD) samples were collected. To verify the effectiveness of field decontamination procedures, equipment rinsate blanks were collected by rinsing laboratory-supplied analyte-free water over decontaminated field equipment, such as the hand auger, trowels used to collect sediment, and stainless steel bowls used for sample homogenization, at the end of each day of sampling. The QA/QC samples are tabulated in Table 4.

In addition, trip blanks were used in all sample coolers with samples to be analyzed for VPH. One field blank was collected during the sampling program.

The current project QAPP requires data validation of all analytical results by Gradient; however, in an email dated February 15, 2012, MDEQ approved the use of other contractors for data validation. ARCADIS completed validation of the sediment and surface water data and validated analytical results are presented in tables and figures, and discussed below.

2.4 Results

2.4.1 Screening Criteria

Fifty-six sediment samples and nine surface water samples were collected and analyzed to characterize the concentrations of constituents that could be associated with potential crude oil impacts associated with the Silvertip Pipeline Incident. Concentrations of individual organic compounds or organic compounds in samples were compared to screening levels established in the Comprehensive Sampling and Analysis Plan (SAP; CTEH 2011a). The terms “individual organic compound” and “organic compound” are used in the discussion of sediment data. Individual organic compound indicates distinct organic compounds (i.e., SVOCs, PAHs, methyl tert-butyl ether, benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, and naphthalene). Organic compound indicates a group of organic compounds (e.g., VPH, TEH, C11-C12 aromatics, etc.).

Sediment analytical results were compared to USEPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Sediment Screening Benchmarks (USEPA 2006), if available. In cases where a BTAG value was not available for an individual organic compound or organic compound, National Oceanic and Atmospheric Administration Screening Quick Reference Table (SQuiRT) values were reviewed

(Buchman 2008). SQuiRT freshwater sediment values were considered, as the Yellowstone River is freshwater. However, consideration of SQuiRT values did not provide any additional screening values for the evaluation. In other words, SQuiRT values were not available for compounds that were detected in sediment but did not have a corresponding BTAG value. EPH and VPH sediment analytical results were also screened against Tier 1 Risk-Based Screening Levels (RBSLs) identified in MDEQ's September 2009 Risk-Based Corrective Action guidance document (MDEQ 2009), per MDEQ recommendation in the draft Administrative Order on Consent. This comparison was done as it was recommended by MDEQ; however, evaluating ecological risk to freshwater benthic invertebrates by comparing results to soil criteria is not appropriate. The RBSLs are based on human health receptors and are not relevant to evaluate risks to freshwater benthic invertebrates.

Sediment analytical results validated by ARCADIS and screened against the BTAG and RBSL values are tabulated in Table 5. Surface water concentrations validated by ARCADIS were compared to MDEQ's Circular DEQ-7 Montana Numeric Water Quality Human Health Standards (HHS) and to the DEQ-7 Aquatic Life Standards, both acute and chronic (ALS; MDEQ 2010), and are presented in Table 6.

The Massachusetts Department of Environmental Protection (MADEP) Montana modified EPH analysis includes an initial screen that provides a TEH result. For sediment samples, if the TEH concentration was greater than 200 mg/kg, then the EPH fraction analysis was performed. The EPH fraction analysis provides results for ranges of aliphatic and aromatic petroleum hydrocarbons (e.g., aliphatic C9-C18, aromatic C11-C22). For surface water samples, if the TEH concentration was greater than 1,000 micrograms per liter (µg/L), EPH fraction and PAH analysis (via 8270 SIM) was performed.

The MADEP Montana modified VPH analysis does not include an initial screen. The analysis provides results for individual organic compounds (e.g., BTEX) and ranges of petroleum hydrocarbons (e.g., C5-C8 aliphatic, C9-C12 aliphatic), along with a value for Total Purgeable Hydrocarbons.

There are a number of individual organic compounds and organic compounds that do not have screening criteria values. Detections of these individual organic compounds and organic compounds are discussed below.

2.4.2 Sediment Sample Results

Analytical results for the 56 sediment samples are presented in Table 5. Of the 56 sediment samples, 46 samples (approximately 82%) had no detections of individual organic compounds. The remaining 10 samples (approximately 18%) had detections of individual organic compounds as follows:

- Sediment samples from five locations (seven samples total) had detections of individual PAHs analyzed via method 8270 SIM; however, all results were below their respective BTAG values. The samples collected at these locations are BIMT1028SE103, BIMT1028SE108, BIMT1031SE106, BIMT1031SE108, BIMT1102SE106, LAMT1027SE104, and LAMT1027SE105.

- Sediment samples from three locations had concentrations of individual organic compounds above BTAG screening values. Sediment samples LAMT1026SE101, LAMT1027SE107, and LAMT1027SE111 exceeded the BTAG for bis(2-ethylhexyl)phthalate (BEHP; 0.180 mg/kg) with detections at 4.03 mg/kg, 9.41 mg/kg, and 0.237 J mg/kg, respectively. Sample LAMT1026SE101 is located at one of the woody debris piles; however, BEHP was not detected in either of the two delineation samples collected at this location (LAMT1026SE102 and LAMT1026SE103). It should be noted that BEHP is a plasticizer that is found in many plastics and is a potential laboratory contaminant and was not detected in Silvertip Pipeline crude oil. Therefore, BEHP is not considered to be related to the Silvertip Pipeline Incident.

TEH was detected in 12 of the 56 sediment samples (approximately 79% of the sediment samples had no detections of TEH) as follows:

- Detected TEH concentrations ranged from 7.9 mg/kg to 1,230 mg/kg.

- Two locations (two samples at one location and one sample at the other) had TEH detections above 200 mg/kg, which exceeded the RBSL benchmark and required analysis of EPH fractions. The samples are LAMT1027SE104 and LAMT1027SE105, which are the 0 to 6-inch sample and 6 to 11-inch sample at the same location, and LAMT1101SE104.

- Sediment sample LAMT1027SE104 exceeded the RBSL criterion for C11-C22 Aromatics (400 mg/kg) with a concentration of 450 mg/kg. However, this exceedance and the three exceedances noted above were the only exceedances of the RBSL criteria.

VPH constituents were detected in 18 of the 56 sediment samples (approximately 68% not detected). However, there were no results that exceeded RBSL benchmark values, and only one sample had a BTAG exceedance. The single BTAG exceedance was a naphthalene result in sample LAMT1101SE104 with a value of 0.46 mg/kg, which is above the BTAG for naphthalene of 0.176 mg/kg. While a variety of analytical methods can detect PAHs, analysis via method 8270 SIM is a more definitive analysis and better meets data quality objectives compared to VPH analysis. Naphthalene results detected using the 8720 SIM method did not exceed BTAG screening levels.

Of the four samples that had BTAG exceedances for any of the analytical constituents, three were samples collected from the top 6 inches of sediment. The fourth sample was from a 6 to 12-inch segment; however, the exceedance was for BEHP. Of the four samples that had RBSL exceedances, three were from one location (two exceedances in the top 6 inches of sediment and one from the 6 to 11-inch segment), and the fourth was from a 0 to 5.5-inch segment. Additionally, although multiple samples were collected at select locations as described in Section 2.1, with the exception of sample LAMT1026SE101 discussed above, there were no BTAG exceedances at any of the locations where multiple samples were collected. In general, it does not appear that sample result concentrations varied with depth.

2.4.2.1 Re-sampled Sediment Locations

Analytical results from the three locations that were re-sampled were compared to the original sample results. Sample LAMT1027SE106 was collected at the same location LAMT0827SE504 was collected, which had results with detections of BTEX. Sample LAMT1027SE106 had a detected value for methyl tert-butyl ether (0.022 mg/kg, which is below the RBSL benchmark of 0.08000 mg/kg); however, BTEX was not detected. Methyl tert-butyl ether was not detected in Silvertip Pipeline crude oil. Therefore, methyl tert-butyl ether is not considered to be related to the Silvertip Pipeline Incident.

Samples LAMT1101SE101 through LAMT1101SE103 were collected from the locations where MDEQ samples ST-YELLR-02 and ST-YELLR-03 were collected and had detections of TEH greater than 200 mg/kg. Samples LAMT1101SE101 through LAMT1101SE103 did not have detected results for any individual organic compounds or organic compounds, including TEH.

2.4.3 Surface Water Sample Results

A surface water sample was collected in conjunction with the sediment sample at locations where a sheen was observed, as described in the Downstream Impacted

Areas Soil and Sediment Sampling Plan. Sheen was observed at three sampling locations, and seven surface water samples were collected (samples BIMT1031SW101, BIMT1031SW102, LAMT1101SW101 through LAMT1101SW103, BIMT1102SW101, and BIMT1102SW102).

Analytical results for the seven surface water samples collected are presented in Table 6. As there were no EPH values above 1,000 ppb, samples were not analyzed for EPH fractions or PAHs. Delineation surface water samples were collected at one location (LAMT1101SW101 through LAMT1101SW103); however, none of the samples had any exceedances of the benchmark values. The only detected result was for toluene in sample LAMT1101SW103 with a value of 0.12 µg/l, which is well below the benchmark value of 1,000 µg/l.

3. References

ARCADIS. 2011a. Downstream Impacted Areas Soil and Sediment Sampling Plan, Silvertip Pipeline Incident, Laurel, Montana. ARCADIS U.S., Inc. August 5.

ARCADIS. 2011b. Downstream Impacted Areas Soil and Sediment Data Summary Report. Silvertip Pipeline Incident, Laurel, Montana. ARCADIS U.S., Inc. November.

Buchman, M. F. 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

CTEH. 2011a. Comprehensive Sampling and Analysis Plan. Silvertip Pipeline Incident, Laurel, Montana. Center for Toxicology and Environmental Health, LLC. August 5.

CTEH. 2011b. Quality Assurance Project Plan for Comprehensive Sampling and Analysis Plan. Silvertip Pipeline Incident Action Plan, Laurel, Montana. Center for Toxicology and Environmental Health, LLC. August 5.

EMES. 2011. DRAFT Additional Sediment Investigation and Proposed Sediment Sampling Locations, Silvertip Pipeline Incident Response, Laurel, Montana. ExxonMobil Environmental Services Company. October 21.

MDEQ. 2009. Montana Tier 1 Risk-Based Corrective Action Guidance for Petroleum Releases. Montana Department of Environmental Quality. September.

MDEQ. 2010. Circular DEQ-7 Montana Numeric Water Quality Standards. Montana Department of Environmental Quality. August.

MDEQ. 2011. Additional Sediment Investigation and Proposed Sediment Sampling Locations. Montana Department of Environmental Quality. October 19.

USEPA. 2006. Region 3 Biological Technical Assistance Group Freshwater Sediment Screening Benchmarks. United States Environmental Protection Agency. August 2006.

Table 1
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Locations
Silvertip Pipeline Incident Response
Laurel, Montana

Sample ID	Sample Purpose	Longitude	Latitude
		Decimal Degrees	Decimal Degrees
LAMT1101SE103	Resample based on USEPA sample results	-108.74950	45.65587
LAMT1101SE101	Resample based on USEPA sample results	-108.75021	45.65587
LAMT1101SW101	Delineate debris pile impacts	-108.72309	45.65026
LAMT1101SW102	Delineate debris pile impacts	-108.72295	45.65033
LAMT1101SW103	Delineate debris pile impacts	-108.72345	45.65027
LAMT1101SE104	Delineate debris pile impacts	-108.72316	45.65022
LAMT1026SE105	Delineate debris pile impacts	-108.68612	45.67072
LAMT1026SE106	Delineate debris pile impacts		
LAMT1027SE101	Delineate debris pile impacts	-108.68623	45.67075
LAMT1027SE102	Delineate debris pile impacts		
LAMT1027SE103	Delineate debris pile impacts		
LAMT1027SE104	Delineate debris pile impacts	-108.68592	45.67086
LAMT1027SE105	Delineate debris pile impacts		
LAMT1027SE106	Resample based on EMES sample results	-108.67810	45.67388
LAMT1028SE101	Investigate sheen observed on water	-108.65680	45.68639
LAMT1028SE102	Investigate sheen observed on water		
LAMT1026SE101	Delineate debris pile impacts	-108.65150	45.68787
LAMT1026SE102	Delineate debris pile impacts	-108.65142	45.68788
LAMT1026SE103	Delineate debris pile impacts	-108.65146	45.68793
BIMT1102SE101	EMES requested	-108.62636	45.69457
BIMT1102SE102	EMES requested		
BIMT1102SE103	EMES requested	-108.62629	45.69458
BIMT1102SE104	EMES requested	-108.62626	45.69462
BIMT1102SE105	EMES requested	-108.62625	45.69465
BIMT1102SE106	EMES requested	-108.62622	45.69463
BIMT1102SW101	EMES requested	-108.62630	45.69458
BIMT1102SW102	EMES requested	-108.62624	45.69464
BIMT1028SE107	Investigate sheen observed on water	-108.60780	45.70342
BIMT1028SE108	Investigate sheen observed on water		
BIMT1028SE109	Investigate sheen observed on water		

Table 1
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Locations
Silvertip Pipeline Incident Response
Laurel, Montana

Sample ID	Sample Purpose	Longitude	Latitude
		Decimal Degrees	Decimal Degrees
BIMT1028SE111	Investigate sheen observed on water	-108.60727	45.70388
BIMT1029SE101	Investigate sheen observed on water	-108.60845	45.70284
BIMT1029SE102	Investigate sheen observed on water		
BIMT1029SE103	Investigate sheen observed on water		
BIMT1029SE104	Investigate sheen observed on water	-108.60246	45.70632
BIMT1031SE106	Investigate sheen observed on water	-108.59455	45.71965
BIMT1031SE107	Investigate sheen observed on water		
BIMT1031SE108	Investigate sheen observed on water		
BIMT1101SE101	Investigate sheen observed on water	-108.57635	45.72316
BIMT1101SE102	Investigate sheen observed on water		
BIMT1102SE107	Investigate sheen observed on water	-108.52284	45.73865
BIMT1102SE108	Investigate sheen observed on water		
BIMT1031SW101	Investigate sheen observed on water	-108.47680	45.78391
BIMT1031SW102	Investigate sheen observed on water	-108.47696	45.78393
BIMT1031SE101	Investigate sheen observed on water	-108.47680	45.78391
BIMT1031SE102	Investigate sheen observed on water		
BIMT1031SE103	Investigate sheen observed on water		
BIMT1031SE104	Investigate sheen observed on water	-108.47696	45.78393
BIMT1031SE105	Investigate sheen observed on water		
LAMT1027SE107	Investigate sheen observed on water	-108.57564	45.72027
LAMT1027SE108	Investigate sheen observed on water		
LAMT1027SE109	Investigate sheen observed on water		
LAMT1027SE110	Investigate sheen observed on water	-108.57596	45.72012
LAMT1027SE111	Investigate sheen observed on water		
LAMT1027SE112	Investigate sheen observed on water		
BIMT1028SE101	Investigate sheen observed on water	-108.57521	45.71996
BIMT1028SE102	Investigate sheen observed on water		
BIMT1028SE103	Investigate sheen observed on water	-108.57525	45.72010
BIMT1028SE104	Investigate sheen observed on water		
BIMT1028SE105	Investigate sheen observed on water	-108.57485	45.72077
BIMT1028SE106	Investigate sheen observed on water		

Notes:
Coordinates are in World Geodetic System (WGS84).
Elevations are feet above WGS84 ellipsoid.
USEPA = U.S. Environmental Protection Agency
EMES = ExxonMobil Environmental Services Company

Table 2
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Descriptions
Silvertip Pipeline Incident Response
Laurel, Montana

Sample ID	Sample Date	Sample Info[1]	USCS	PID (ppm)
LAMT1101SE103	11/1/2011	0 to 5 inch sample	SM	0.0
LAMT1101SE101	11/1/2011	0 to 4.5 inch sample	SP	0.0
LAMT1101SE104	11/1/2011	0 to 5.5 inch sample	ML	3.1
LAMT1026SE105	10/26/2011	0 to 6 inch sample	SM	1.4
LAMT1026SE106	10/26/2011	6 to 10 inch sample	SP-SM	1.1
LAMT1027SE101	10/27/2011	0 to 6 inch sample	SP	0.0
LAMT1027SE102	10/27/2011	6 to 12 inch sample	SP	0.1
LAMT1027SE103	10/27/2011	12 to 18 inch sample	ML	0.1
LAMT1027SE104	10/27/2011	0 to 6 inch sample	ML	0.0
LAMT1027SE105	10/27/2011	6 to 11 inch sample	ML	0.0
LAMT1027SE106	10/27/2011	0 to 6 inch sample	ML	0.4
LAMT1028SE101	10/28/2011	0 to 6 inch sample	SP-SM	0.9
LAMT1028SE102	10/28/2011	6 to 11 inch sample	SP-SM	0.5
LAMT1026SE101	10/26/2011	0 to 7 inch sample	SM	0.1
LAMT1026SE102	10/26/2011	0 to 4 inch sample	SM	0.1
LAMT1026SE103	10/26/2011	0 to 6 inch sample	SP	0.1
BIMT1102SE101	11/2/2011	0 to 6 inch sample	SP	0.0
BIMT1102SE102	11/2/2011	6 to 11 inch sample	SM	0.0
BIMT1102SE103	11/2/2011	0 to 4 inch sample	SM	0.1
BIMT1102SE104	11/2/2011	0 to 3 inch sample	GP	0.1
BIMT1102SE105	11/2/2011	0 to 3 inch sample	GP	0.4
BIMT1102SE106	11/2/2011	0 to 4 inch sample	SP-SM	0.3
BIMT1028SE107	10/28/2011	0 to 6 inch sample	SM	0.1
BIMT1028SE108	10/28/2011	6 to 12 inch sample	SM	0.3
BIMT1028SE109	10/28/2011	12 to 18 inch sample	SM	0.4
BIMT1028SE111	10/28/2011	0 to 5.5 inch sample	SW	0.4
BIMT1029SE101	10/29/2011	0 to 6 inch sample	SM	0.1
BIMT1029SE102	10/29/2011	6 to 12 inch sample	ML	0.2
BIMT1029SE103	10/29/2011	12 to 18 inch sample	SM	0.1
BIMT1029SE104	10/29/2011	0 to 6 inch sample	SW-SM	0.0
BIMT1031SE106	10/31/2011	0 to 6 inch sample	ML	0.3
BIMT1031SE107	10/31/2011	6 to 12 inch sample	SM	0.3
BIMT1031SE108	10/31/2011	12 to 18 inch sample	SM	0.4
BIMT1101SE101	11/1/2011	0 to 6 inch sample	SP	0.1
BIMT1101SE102	11/1/2011	6 to 12 inch sample	SP-SM	0.0

Table 2
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Descriptions
Silvertip Pipeline Incident Response
Laurel, Montana

Sample ID	Sample Date	Sample Info[1]	USCS	PID (ppm)
BIMT1102SE107	11/2/2011	0 to 6 inch sample	ML	0.1
BIMT1102SE108	11/2/2011	6 to 10 inch sample	ML	0.0
BIMT1031SE101	10/31/2011	0 to 6 inch sample	ML	0.2
BIMT1031SE102	10/31/2011	6 to 12 inch sample	ML	0.4
BIMT1031SE103	10/31/2011	12 to 18 inch sample	ML	0.3
BIMT1031SE104	10/31/2011	0 to 6 inch sample	ML	0.2
BIMT1031SE105	10/31/2011	6 to 12 inch sample	ML	0.5
LAMT1027SE107	10/27/2011	0 to 6 inch sample	SP-SM	1.5
LAMT1027SE108	10/27/2011	6 to 12 inch sample	SP-SM	0.9
LAMT1027SE109	10/27/2011	12 to 18 inch sample	SP-SM	0.9
LAMT1027SE110	10/27/2011	0 to 6 inch sample	SM	0.6
LAMT1027SE111	10/27/2011	6 to 12 inch sample	SM	0.9
LAMT1027SE112	10/27/2011	12 to 18 inch sample	SM	1.1
BIMT1028SE101	10/28/2011	0 to 6 inch sample	ML	0.2
BIMT1028SE102	10/28/2011	6 to 12 inch sample	ML	0.3
BIMT1028SE103	10/28/2011	0 to 6 inch sample	ML	0.4
BIMT1028SE104	10/28/2011	6 to 12 inch sample	ML	0.6
BIMT1028SE105	10/28/2011	0 to 6 inch sample	ML	0.8
BIMT1028SE106	10/28/2011	6 to 12 inch sample	ML	0.6

Notes:

1. Depths are in inches below sediment surface.

GP = poorly-graded gravels, gravel-sand mixtures, little or no fines

ML = inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity

PID = photoionization detector

ppm = parts per million

SM = silty sands, sand-silt mixtures

SP = poorly graded sands, gravelly sands, little or no fines

SW = well-graded sands, gravelly sands,little or no fines

USCS = Unified Soil Classification System

Table 3
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment and Surface Water Sample Key
Silvertip Pipeline Incident
Laurel, Montana

Sample ID	Duplicate ID	Sample Date	Sample Info	Notes
BIMT1028SE101		10/28/2011	0 to 6 inch sample	
BIMT1028SE102		10/28/2011	6 to 12 inch sample	
BIMT1028SE103		10/28/2011	0 to 6 inch sample	
BIMT1028SE104		10/28/2011	6 to 12 inch sample	
BIMT1028SE105		10/28/2011	0 to 6 inch sample	
BIMT1028SE106		10/28/2011	6 to 12 inch sample	
BIMT1028SE107		10/28/2011	0 to 6 inch sample	
BIMT1028SE108		10/28/2011	6 to 12 inch sample	
BIMT1028SE109	BIMT1028SE110	10/28/2011	12 to 18 inch sample	
BIMT1028SE111		10/28/2011	0 to 5.5 inch sample	
BIMT1029SE101		10/29/2011	0 to 6 inch sample	
BIMT1029SE102		10/29/2011	6 to 12 inch sample	
BIMT1029SE103		10/29/2011	12 to 18 inch sample	
BIMT1029SE104		10/29/2011	0 to 6 inch sample	
BIMT1031SE101		10/31/2011	0 to 6 inch sample	
BIMT1031SE102		10/31/2011	6 to 12 inch sample	
BIMT1031SE103		10/31/2011	12 to 18 inch sample	
BIMT1031SE104		10/31/2011	0 to 6 inch sample	
BIMT1031SE105		10/31/2011	6 to 12 inch sample	
BIMT1031SE106		10/31/2011	0 to 6 inch sample	
BIMT1031SE107		10/31/2011	6 to 12 inch sample	
BIMT1031SE108		10/31/2011	12 to 18 inch sample	
BIMT1031SW101		10/31/2011	surface water sample	
BIMT1031SW102		10/31/2011	surface water sample	
BIMT1101SE101		11/1/2011	0 to 6 inch sample	
BIMT1101SE102		11/1/2011	6 to 12 inch sample	
BIMT1102SE101		11/2/2011	0 to 6 inch sample	
BIMT1102SE102		11/2/2011	6 to 11 inch sample	
BIMT1102SE103		11/2/2011	0 to 4 inch sample	
BIMT1102SE104		11/2/2011	0 to 3 inch sample	

Table 3
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment and Surface Water Sample Key
Silvertip Pipeline Incident
Laurel, Montana

Sample ID	Duplicate ID	Sample Date	Sample Info	Notes
BIMT1102SE105		11/2/2011	0 to 3 inch sample	
BIMT1102SE106		11/2/2011	0 to 4 inch sample	
BIMT1102SE107		11/2/2011	0 to 6 inch sample	MS/MSD
BIMT1102SE108		11/2/2011	6 to 10 inch sample	
BIMT1102SW101		11/2/2011	surface water sample	
BIMT1102SW102		11/2/2011	surface water sample	
LAMT1026SE101		10/26/2011	0 to 7 inch sample	
LAMT1026SE102		10/26/2011	0 to 4 inch sample	
LAMT1026SE103		10/26/2011	0 to 6 inch sample	
LAMT1026SE105		10/26/2011	0 to 6 inch sample	
LAMT1026SE106		10/26/2011	6 to 10 inch sample	
LAMT1027SE101		10/27/2011	0 to 6 inch sample	
LAMT1027SE102		10/27/2011	6 to 12 inch sample	
LAMT1027SE103		10/27/2011	12 to 18 inch sample	
LAMT1027SE104		10/27/2011	0 to 6 inch sample	
LAMT1027SE105		10/27/2011	6 to 11 inch sample	
LAMT1027SE106		10/27/2011	0 to 6 inch sample	
LAMT1027SE107		10/27/2011	0 to 6 inch sample	
LAMT1027SE108		10/27/2011	6 to 12 inch sample	
LAMT1027SE109		10/27/2011	12 to 18 inch sample	
LAMT1027SE110		10/27/2011	0 to 6 inch sample	
LAMT1027SE111		10/27/2011	6 to 12 inch sample	
LAMT1027SE112		10/27/2011	12 to 18 inch sample	
LAMT1028SE101		10/28/2011	0 to 6 inch sample	
LAMT1028SE102		10/28/2011	6 to 11 inch sample	
LAMT1101SE101		11/1/2011	0 to 4.5 inch sample	MS/MSD
LAMT1101SE103	LAMT1101SE102	11/1/2011	0 to 5 inch sample	
LAMT1101SE104		11/1/2011	0 to 5.5 inch sample	
LAMT1101SW101		11/1/2011	surface water sample	
LAMT1101SW102		11/1/2011	surface water sample	
LAMT1101SW103		11/1/2011	surface water sample	

Note:
MS/MSD = Matrix spike and matrix spike duplicate

Table 4
October 2011 Downstream Sediment Sampling Data Summary Report
QA/QC Sample Key
Silvertip Pipeline Incident Response
Laurel, Montana

Date Sampled	Sample ID	Type
10/25/2011	GLMT1025SW102	Rinsate Blank
10/26/2011	LAMT1026SW101	Rinsate Blank
10/27/2011	LAMT1027SE113	Trip Blank
10/27/2011	LAMT1027SE114	Trip Blank
10/27/2011	LAMT1027SE115	Trip Blank
10/27/2011	LAMT1027SE116	Trip Blank
10/28/2011	LAMT1028SE103	Field blank
10/28/2011	BIMT1028SW101	Rinsate Blank for 10/27/11
10/28/2011	BIMT1028SW102	Rinsate Blank for 10/28/11
10/28/2011	BIMT1028SE112	Trip Blank
10/28/2011	BIMT1028SE113	Trip Blank
10/31/2011	BIMT1031SW103	Rinsate Blank
11/1/2011	LAMT1101SW104	Rinsate Blank
11/1/2011	LAMT1101SE101	MS/MSD
11/2/2011	BIMT1102SE103	Rinsate Blank
11/2/2011	BIMT1102SE107	MS/MSD

Note:
MS/MSD = Matrix spike and matrix spike duplicate

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE101		BIMT1028SE102		BIMT1028SE103		BIMT1028SE104		BIMT1028SE105	
					Sample Date	10/28/2011		10/28/2011		10/28/2011		10/28/2011		10/28/2011	
					Start Depth (in)	0		6		0		6		0	
					End Depth (in)	6		12		6		12		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Quals**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**37.8**		**38.6**		**29.4**		**28.8**		**31.0**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
1,2-Diphenylhydrazine	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
1-Methylnaphthalene	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2,4,5-Trichlorophenol	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2,4-Dinitrophenol	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2,6-Dinitrotoluene	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2-Chloronaphthalene	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
2-Nitroaniline	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
2-Nitrophenol	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
3&4-Methylphenol	mg/kg					< 1.06	U	< 1.07	U	< 0.935	U	< 0.926	U	< 0.957	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 1.08	U	< 1.09	U	< 0.949	U	< 0.94	U	< 0.971	U
3-Nitroaniline	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
4-Chloro-3-Methylphenol	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
4-Chloroaniline	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
4-Nitroaniline	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
4-Nitrophenol	mg/kg					< 2.73	U	< 2.76	U	< 2.41	U	< 2.39	U	< 2.46	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Anthracene	mg/kg	0.05720	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Benzo(b)fluoranthene	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Carbazole	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Chrysene	mg/kg	0.1660	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE101		BIMT1028SE102		BIMT1028SE103		BIMT1028SE104		BIMT1028SE105	
					Sample Date	10/28/2011		10/28/2011		10/28/2011		10/28/2011		10/28/2011	
					Start Depth (in)	0		6		0		6		0	
					End Depth (in)	6		12		6		12		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Quals**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Di-n-Octyl Phthalate	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Fluorene	mg/kg	0.07740	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Isophorone	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Naphthalene	mg/kg	0.1760	h			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Nitrobenzene	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
N-Nitrosodimethylamine	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 1.08	U	< 1.09	U	< 0.949	U	< 0.94	U	< 0.971	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Phenol	mg/kg	0.4200	f,3,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
Pyrene	mg/kg	0.1950	h,B			< 0.53	U	< 0.535	U	< 0.467	U	< 0.463	U	< 0.478	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Anthracene	mg/kg	0.05720	h,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Benzo(b)fluoranthene	mg/kg					< 0.0161	U	< 0.0162	U	**0.0084**	J	< 0.0140	U	< 0.0145	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Chrysene	mg/kg	0.1660	h,B			< 0.0161	U	< 0.0162	U	**0.0073**	J	< 0.0140	U	< 0.0145	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0161	U	< 0.0162	U	**0.0150**		< 0.0140	U	< 0.0145	U
Fluorene	mg/kg	0.07740	h,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Naphthalene	mg/kg	0.1760	h			< 0.0161	U	< 0.0162	U	< 0.0142	U	< 0.0140	U	< 0.0145	U
Pyrene	mg/kg	0.1950	h,B			< 0.0161	U	< 0.0162	U	**0.0130**	J	< 0.0140	U	< 0.0145	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**12500**		**13300**		**9980**		**6720**		**12300**	
Total Organic Carbon	mg/kg					**16300**		**12600**		**9140**		**5990**		**15000**	
						10100		**14100**		**10700**		**5630**		**10700**	
						11600		**13900**		**9960**		**7840**		**11300**	
						12000		**12400**		**10100**		**7410**		**12300**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		**69.9**		**56.5**		**37.1**		< 14.0	U	< 14.4	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 7.8	U	< 7.9	U	< 6.9	U	< 7.0	U	< 7.0	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 7.8	U	< 7.9	U	< 6.9	U	< 7.0	U	< 7.0	U
Benzene	mg/kg			0.04	c,**l	< 0.039	U	< 0.040	U	< 0.034	U	< 0.035	U	< 0.035	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.6	U	< 1.6	U	< 1.4	U	< 1.4	U	< 1.4	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.078	U	< 0.079	U	< 0.069	U	< 0.070	U	< 0.070	U
m&p-Xylene	mg/kg					< 0.16	U	< 0.16	U	< 0.14	U	< 0.14	U	< 0.14	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.078	U	< 0.079	U	< 0.069	U	< 0.070	U	< 0.070	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.93	U	< 0.95	U	< 0.83	U	< 0.84	U	< 0.84	U
o-Xylene	mg/kg					< 0.078	U	< 0.079	U	< 0.069	U	< 0.070	U	< 0.070	U
Toluene	mg/kg			10	n,l	< 0.078	U	< 0.079	U	< 0.069	U	< 0.070	U	< 0.070	U
Total Purgeable Hydrocarbo	mg/kg					< 15.5	U	< 15.8	U	< 13.8	U	< 14.0	U	< 13.9	U
Xylenes, Total	mg/kg			70	n,dc	< 0.23	U	< 0.24	U	< 0.21	U	< 0.21	U	< 0.21	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE106		BIMT1028SE107		BIMT1028SE108		BIMT1028SE109		BIMT1028SE110	
					Sample Date	10/28/2011		10/28/2011		10/28/2011		10/28/2011		10/28/2011	
					Start Depth (in)	6		0		6		12		12	
					End Depth (in)	12		6		12		18		18	
					Sample Type	Normal		Normal		Normal		Normal		Field Duplicate	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**29.8**		**11.4**		**12.6**		**15.7**		**15.2**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
1,2-Diphenylhydrazine	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
1-Methylnaphthalene	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2,4,5-Trichlorophenol	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2,4-Dinitrophenol	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2,6-Dinitrotoluene	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2-Chloronaphthalene	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
2-Nitroaniline	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
2-Nitrophenol	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
3&4-Methylphenol	mg/kg					< 0.937	U	< 0.745	U	< 0.755	U	< 0.78	U	< 0.778	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.951	U	< 0.757	U	< 0.767	U	< 0.792	U	< 0.79	U
3-Nitroaniline	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
4-Chloro-3-Methylphenol	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
4-Chloroaniline	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
4-Nitroaniline	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
4-Nitrophenol	mg/kg					< 2.41	U	< 1.92	U	< 1.95	U	< 2.01	U	< 2.01	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Anthracene	mg/kg	0.05720	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Benzo(b)fluoranthene	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Carbazole	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Chrysene	mg/kg	0.1660	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE106		BIMT1028SE107		BIMT1028SE108		BIMT1028SE109		BIMT1028SE110	
					Sample Date	10/28/2011		10/28/2011		10/28/2011		10/28/2011		10/28/2011	
					Start Depth (in)	6		0		6		12		12	
					End Depth (in)	12		6		12		18		18	
					Sample Type	Normal		Normal		Normal		Normal		Field Duplicate	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Di-n-Octyl Phthalate	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Fluorene	mg/kg	0.07740	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Isophorone	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Naphthalene	mg/kg	0.1760	h			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Nitrobenzene	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
N-Nitrosodimethylamine	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.951	U	< 0.757	U	< 0.767	U	< 0.792	U	< 0.79	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Phenol	mg/kg	0.4200	f,3,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
Pyrene	mg/kg	0.1950	h,B			< 0.468	U	< 0.373	U	< 0.378	U	< 0.39	U	< 0.389	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Anthracene	mg/kg	0.05720	h,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0142	U	< 0.0113	U	**0.0110**	J	< 0.0119	U	< 0.0118	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0142	U	< 0.0113	U	**0.0078**	J	< 0.0119	U	< 0.0118	U
Benzo(b)fluoranthene	mg/kg					< 0.0142	U	< 0.0113	U	**0.0116**		< 0.0119	U	< 0.0118	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Chrysene	mg/kg	0.1660	h,B			< 0.0142	U	< 0.0113	U	**0.0104**	J	< 0.0119	U	< 0.0118	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0142	U	< 0.0113	U	**0.0232**		< 0.0119	U	< 0.0118	U
Fluorene	mg/kg	0.07740	h,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Naphthalene	mg/kg	0.1760	h			< 0.0142	U	< 0.0113	U	< 0.0114	U	< 0.0119	U	< 0.0118	U
Pyrene	mg/kg	0.1950	h,B			< 0.0142	U	< 0.0113	U	**0.0212**		< 0.0119	U	< 0.0118	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**10600**		**2170**		**5170**		**2890**		**2080**	
Total Organic Carbon	mg/kg					**11100**		**2300**		**6240**		**2860**		**2160**	
						10400		**2490**		**4450**		**2380**		**2430**	
						10700		**2020**		**4370**		**3120**		**1990**	
						10100		**1870**		**5640**		**3220**		**1750**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 14.2	U	< 11.2	U	< 11.3	U	< 11.8	U	< 11.6	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 7.1	U	< 5.5	U	< 5.6	U	< 5.9	U	< 5.8	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 7.1	U	< 5.5	U	< 5.6	U	< 5.9	U	< 5.8	U
Benzene	mg/kg			0.04	c,**l	< 0.036	U	< 0.027	U	< 0.028	U	< 0.030	U	< 0.029	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.4	U	< 1.1	U	< 1.1	U	< 1.2	U	< 1.2	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.071	U	< 0.055	U	< 0.056	U	< 0.059	U	< 0.058	U
m&p-Xylene	mg/kg					< 0.14	U	< 0.11	U	< 0.11	U	< 0.12	U	< 0.12	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.071	U	< 0.055	U	< 0.056	U	< 0.059	U	< 0.058	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.85	U	< 0.66	U	< 0.68	U	< 0.71	U	< 0.70	U
o-Xylene	mg/kg					< 0.071	U	< 0.055	U	< 0.056	U	< 0.059	U	< 0.058	U
Toluene	mg/kg			10	n,l	< 0.071	U	< 0.055	U	< 0.056	U	< 0.059	U	< 0.058	U
Total Purgeable Hydrocarbo	mg/kg					< 14.2	U	< 11.0	U	< 11.3	U	< 11.8	U	< 11.7	U
Xylenes, Total	mg/kg			70	n,dc	< 0.21	U	< 0.16	U	< 0.17	U	< 0.18	U	< 0.18	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE111		BIMT1029SE101		BIMT1029SE102		BIMT1029SE103		BIMT1029SE104	
					Sample Date	10/28/2011		10/29/2011		10/29/2011		10/29/2011		10/29/2011	
					Start Depth (in)	0		0		6		12		0	
					End Depth (in)	5.5		6		12		18		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**2.8**		**15.3**		**19.4**		**11.5**		**24.2**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
1,2-Diphenylhydrazine	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
1-Methylnaphthalene	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2,4,5-Trichlorophenol	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2,4-Dinitrophenol	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2,6-Dinitrotoluene	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2-Chloronaphthalene	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
2-Nitroaniline	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
2-Nitrophenol	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
3&4-Methylphenol	mg/kg					< 0.679	U	< 0.777	U	< 0.818	U	< 0.743	U	< 0.871	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.689	U	< 0.789	U	< 0.831	U	< 0.755	U	< 0.884	U
3-Nitroaniline	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
4,6-Dinitro-2-methylphenol	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
4-Chloro-3-Methylphenol	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
4-Chloroaniline	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
4-Nitroaniline	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
4-Nitrophenol	mg/kg					< 1.75	U	< 2	U	< 2.11	U	< 1.91	U	< 2.24	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Anthracene	mg/kg	0.05720	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Benzo(b)fluoranthene	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Carbazole	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Chrysene	mg/kg	0.1660	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1028SE111		BIMT1029SE101		BIMT1029SE102		BIMT1029SE103		BIMT1029SE104	
					Sample Date	10/28/2011		10/29/2011		10/29/2011		10/29/2011		10/29/2011	
					Start Depth (in)	0		0		6		12		0	
					End Depth (in)	5.5		6		12		18		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Di-n-Octyl Phthalate	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Fluorene	mg/kg	0.07740	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Isophorone	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Naphthalene	mg/kg	0.1760	h			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Nitrobenzene	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
N-Nitrosodimethylamine	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.689	U	< 0.789	U	< 0.831	U	< 0.755	U	< 0.884	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Phenol	mg/kg	0.4200	f,3,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
Pyrene	mg/kg	0.1950	h,B			< 0.339	U	< 0.388	U	< 0.409	U	< 0.372	U	< 0.435	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Anthracene	mg/kg	0.05720	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Benzo(b)fluoranthene	mg/kg					< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Chrysene	mg/kg	0.1660	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Fluorene	mg/kg	0.07740	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Naphthalene	mg/kg	0.1760	h			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
Pyrene	mg/kg	0.1950	h,B			< 0.0103	U	< 0.0118	U	< 0.0124	U	< 0.0113	U	< 0.0132	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**646**		**7600**		**10800**		**1640**		**562**	
Total Organic Carbon	mg/kg					**594**		**5920**		**9830**		**1960**		**677**	
						605		**12900**		**15300**		**1690**		**522**	
						710		**5570**		**9020**		**939**		**490**	
						673		**6010**		**9090**		**1980**		**558**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 10.3	U	< 11.5	U	< 12.2	U		R	< 12.9	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.1	U	< 5.8	U	< 5.7	U	< 5.8	U	< 6.4	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.1	U	< 5.8	U	< 5.7	U	< 5.8	U	< 6.4	U
Benzene	mg/kg			0.04	c,**l	< 0.025	U	**0.0063**	J	< 0.029	U	< 0.029	U	< 0.032	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.0	U	< 1.2	U	< 1.1	U	< 1.2	U	< 1.3	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.051	U	< 0.058	U	< 0.057	U	< 0.058	U	< 0.064	U
m&p-Xylene	mg/kg					< 0.10	U	< 0.12	U	< 0.11	U	< 0.12	U	< 0.13	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.051	U	< 0.058	U	< 0.057	U	< 0.058	U	**0.013**	J
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.61	U	< 0.70	U	< 0.68	U	< 0.69	U	< 0.77	U
o-Xylene	mg/kg					< 0.051	U	**0.0083**	J	< 0.057	U	< 0.058	U	< 0.064	U
Toluene	mg/kg			10	n,l	< 0.051	U	< 0.058	U	< 0.057	U	< 0.058	U	< 0.064	U
Total Purgeable Hydrocarbo	mg/kg					< 10.2	U	< 11.7	U	< 11.4	U	< 11.6	U	< 12.8	U
Xylenes, Total	mg/kg			70	n,dc	< 0.15	U	< 0.17	U	< 0.17	U	< 0.17	U	< 0.19	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1031SE101		BIMT1031SE102		BIMT1031SE103		BIMT1031SE104		BIMT1031SE105	
					Sample Date	10/31/2011		10/31/2011		10/31/2011		10/31/2011		10/31/2011	
					Start Depth (in)	0		6		12		0		6	
					End Depth (in)	6		12		18		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**30.5**		**35.5**		**34.1**		**37.0**		**29.5**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
1,2-Diphenylhydrazine	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
1-Methylnaphthalene	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2,4,5-Trichlorophenol	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2,4-Dinitrophenol	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2,6-Dinitrotoluene	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2-Chloronaphthalene	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
2-Nitroaniline	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
2-Nitrophenol	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
3&4-Methylphenol	mg/kg					< 0.946	U	< 1.02	U	< 0.999	U	< 1.05	U	< 0.936	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.961	U	< 1.04	U	< 1.01	U	< 1.06	U	< 0.951	U
3-Nitroaniline	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
4-Chloro-3-Methylphenol	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
4-Chloroaniline	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
4-Nitroaniline	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
4-Nitrophenol	mg/kg					< 2.44	U	< 2.63	U	< 2.57	U	< 2.7	U	< 2.41	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Anthracene	mg/kg	0.05720	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Benzo(b)fluoranthene	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Carbazole	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Chrysene	mg/kg	0.1660	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1031SE101		BIMT1031SE102		BIMT1031SE103		BIMT1031SE104		BIMT1031SE105	
					Sample Date	10/31/2011		10/31/2011		10/31/2011		10/31/2011		10/31/2011	
					Start Depth (in)	0		6		12		0		6	
					End Depth (in)	6		12		18		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Di-n-Octyl Phthalate	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Fluorene	mg/kg	0.07740	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Isophorone	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Naphthalene	mg/kg	0.1760	h			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Nitrobenzene	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
N-Nitrosodimethylamine	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.961	U	< 1.04	U	< 1.01	U	< 1.06	U	< 0.951	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Phenol	mg/kg	0.4200	f,3,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
Pyrene	mg/kg	0.1950	h,B			< 0.473	U	< 0.51	U	< 0.499	U	< 0.523	U	< 0.468	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Anthracene	mg/kg	0.05720	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Benzo(b)fluoranthene	mg/kg					< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Chrysene	mg/kg	0.1660	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Fluorene	mg/kg	0.07740	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Naphthalene	mg/kg	0.1760	h			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
Pyrene	mg/kg	0.1950	h,B			< 0.0144	U	< 0.0155	U	< 0.0151	U	< 0.0159	U	< 0.0142	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**7960**		**6750**		**10300**		**8870**		**7690**	
Total Organic Carbon	mg/kg					**7970**		**8260**		**10100**		**9920**		**6770**	
						7490		**6940**		**10700**		**7690**		**8560**	
						8150		**5330**		**9850**		**8720**		**7500**	
						8230		**6470**		**10700**		**9160**		**7950**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 14.4	U	**66.3**		**22.1**		**28.3**		**8.2**	J
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 6.3	U	< 7.3	U	< 8.0	U	< 6.4	U	< 7.7	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 6.3	U	< 7.3	U	< 8.0	U	< 6.4	U	< 7.7	U
Benzene	mg/kg			0.04	c,**l	< 0.031	U	< 0.037	U	< 0.040	U	< 0.032	U	< 0.039	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.3	U	< 1.5	U	< 1.6	U	< 1.3	U	< 1.5	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.063	U	< 0.073	U	< 0.080	U	< 0.064	U	< 0.077	U
m&p-Xylene	mg/kg					< 0.13	U	< 0.15	U	< 0.16	U	< 0.13	U	< 0.15	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.063	U	< 0.073	U	< 0.080	U	< 0.064	U	< 0.077	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.75	U	< 0.88	U	< 0.96	U	< 0.76	U	< 0.93	U
o-Xylene	mg/kg					**0.011**	J	< 0.073	U	**0.0091**	J	< 0.064	U	< 0.077	U
Toluene	mg/kg			10	n,l	< 0.063	U	< 0.073	U	**0.12**		< 0.064	U	< 0.077	U
Total Purgeable Hydrocarbo	mg/kg					< 12.6	U	< 14.6	U	< 16.0	U	< 12.7	U	< 15.5	U
Xylenes, Total	mg/kg			70	n,dc	< 0.19	U	< 0.22	U	< 0.24	U	< 0.19	U	< 0.23	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1031SE106		BIMT1031SE107		BIMT1031SE108		BIMT1101SE101		BIMT1101SE102	
					Sample Date	10/31/2011		10/31/2011		10/31/2011		11/1/2011		11/1/2011	
					Start Depth (in)	0		6		12		0		6	
					End Depth (in)	6		12		18		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	Units	Freshwater Sediment[1]	Supporting Note[1]	RBSL[2]	Supporting Note[2]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
% Moisture															
Percent Moisture	%					**15.0**		**7.7**		**13.5**		**6.5**		**4.9**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
1,2-Diphenylhydrazine	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
1-Methylnaphthalene	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2,4,5-Trichlorophenol	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2,4-Dinitrophenol	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2,6-Dinitrotoluene	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2-Chloronaphthalene	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
2-Nitroaniline	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
2-Nitrophenol	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
3&4-Methylphenol	mg/kg					< 0.776	U	< 0.715	U	< 0.76	U	< 0.703	U	< 0.694	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.788	U	< 0.726	U	< 0.772	U	< 0.714	U	< 0.704	U
3-Nitroaniline	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
4-Chloro-3-Methylphenol	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
4-Chloroaniline	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
4-Chlorophenyl Phenyl Ether	mg/kg		B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
4-Nitroaniline	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
4-Nitrophenol	mg/kg					< 2	U	< 1.84	U	< 1.96	U	< 1.81	U	< 1.79	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Anthracene	mg/kg	0.05720	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Benzo(b)fluoranthene	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Carbazole	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Chrysene	mg/kg	0.1660	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1031SE106		BIMT1031SE107		BIMT1031SE108		BIMT1101SE101		BIMT1101SE102	
					Sample Date	10/31/2011		10/31/2011		10/31/2011		11/1/2011		11/1/2011	
					Start Depth (in)	0		6		12		0		6	
					End Depth (in)	6		12		18		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Di-n-Octyl Phthalate	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Fluorene	mg/kg	0.07740	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Isophorone	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Naphthalene	mg/kg	0.1760	h			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Nitrobenzene	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
N-Nitrosodimethylamine	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.788	U	< 0.726	U	< 0.772	U	< 0.714	U	< 0.704	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Phenol	mg/kg	0.4200	f,3,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
Pyrene	mg/kg	0.1950	h,B			< 0.388	U	< 0.358	U	< 0.38	U	< 0.352	U	< 0.347	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Anthracene	mg/kg	0.05720	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Benzo(b)fluoranthene	mg/kg					**0.0077**	J	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Chrysene	mg/kg	0.1660	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Fluoranthene	mg/kg	0.4230	h,B			**0.0148**		< 0.0108	U	**0.0059**	J	< 0.0107	U	< 0.0105	U
Fluorene	mg/kg	0.07740	h,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Naphthalene	mg/kg	0.1760	h			< 0.0117	U	< 0.0108	U	< 0.0116	U	< 0.0107	U	< 0.0105	U
Pyrene	mg/kg	0.1950	h,B			**0.0115**	J	< 0.0108	U	**0.0068**	J	< 0.0107	U	< 0.0105	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**4600**		**1280**		**9920**		**1820**		**1910**	
Total Organic Carbon	mg/kg					**4770**		**1220**		**9640**		**2060**		**2480**	
						4310		**1150**		**14900**		**1810**		**1550**	
						5910		**1280**		**6080**		**1830**		**1610**	
						3390		**1460**		**9090**		**1600**		**2010**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 11.6	U	< 10.6	U	< 11.4	U	< 10.6	U	< 10.3	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.6	U	< 5.3	U	< 5.0	U	< 5.3	U	< 5.1	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.6	U	< 5.3	U	< 5.0	U	< 5.3	U	< 5.1	U
Benzene	mg/kg			0.04	c,**l	**0.012**	J	< 0.026	U	**0.024**	J	**0.0042**	J	**0.0038**	J
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.1	U	< 1.1	U	< 0.99	U	< 1.1	U	< 1.0	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.056	U	< 0.053	U	**0.032**	J	< 0.053	U	< 0.051	U
m&p-Xylene	mg/kg					< 0.11	U	< 0.11	U	**0.065**	J	< 0.11	U	< 0.10	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.056	U	< 0.053	U	< 0.050	U	< 0.053	U	< 0.051	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.67	U	< 0.64	U	< 0.60	U	< 0.64	U	< 0.62	U
o-Xylene	mg/kg					**0.012**	J	< 0.053	U	**0.031**	J	**0.0067**	J	**0.0077**	J
Toluene	mg/kg			10	n,l	< 0.056	U	< 0.053	U	**0.038**	J	< 0.053	U	< 0.051	U
Total Purgeable Hydrocarbo	mg/kg					< 11.2	U	< 10.6	U	< 9.9	U	< 10.6	U	< 10.3	U
Xylenes, Total	mg/kg			70	n,dc	< 0.17	U	< 0.16	U	< 0.15	U	< 0.16	U	< 0.15	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1102SE101		BIMT1102SE102		BIMT1102SE103		BIMT1102SE104		BIMT1102SE105	
					Sample Date	11/2/2011		11/2/2011		11/2/2011		11/2/2011		11/2/2011	
					Start Depth (in)	0		6		0		0		0	
					End Depth (in)	6		11		4		3		3	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**21.1**		**22.9**		**7.5**		**6.5**		**17.3**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
1,2-Diphenylhydrazine	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
1-Methylnaphthalene	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2,4,5-Trichlorophenol	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2,4-Dinitrophenol	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2,6-Dinitrotoluene	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2-Chloronaphthalene	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
2-Nitroaniline	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
2-Nitrophenol	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
3&4-Methylphenol	mg/kg					< 0.834	U	< 0.856	U	< 0.714	U	< 0.706	U	< 0.798	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.847	U	< 0.869	U	< 0.725	U	< 0.716	U	< 0.81	U
3-Nitroaniline	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
4-Chloro-3-Methylphenol	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
4-Chloroaniline	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
4-Nitroaniline	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
4-Nitrophenol	mg/kg					< 2.15	U	< 2.21	U	< 1.84	U	< 1.82	U	< 2.06	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Anthracene	mg/kg	0.05720	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Benzo(b)fluoranthene	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Carbazole	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Chrysene	mg/kg	0.1660	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1102SE101		BIMT1102SE102		BIMT1102SE103		BIMT1102SE104		BIMT1102SE105	
					Sample Date	11/2/2011		11/2/2011		11/2/2011		11/2/2011		11/2/2011	
					Start Depth (in)	0		6		0		0		0	
					End Depth (in)	6		11		4		3		3	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Di-n-Octyl Phthalate	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Fluorene	mg/kg	0.07740	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Isophorone	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Naphthalene	mg/kg	0.1760	h			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Nitrobenzene	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
N-Nitrosodimethylamine	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.847	U	< 0.869	U	< 0.725	U	< 0.716	U	< 0.81	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Phenol	mg/kg	0.4200	f,3,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
Pyrene	mg/kg	0.1950	h,B			< 0.417	U	< 0.428	U	< 0.357	U	< 0.353	U	< 0.399	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Anthracene	mg/kg	0.05720	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Benzo(b)fluoranthene	mg/kg					< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Chrysene	mg/kg	0.1660	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Fluorene	mg/kg	0.07740	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Naphthalene	mg/kg	0.1760	h			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
Pyrene	mg/kg	0.1950	h,B			< 0.0127	U	< 0.0129	U	< 0.0108	U	< 0.0107	U	< 0.0121	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**784**		**730**		**1070**		**2530**		**2560**	
Total Organic Carbon	mg/kg					**702**		**878**		**1150**		**2450**		**2940**	
						720		**787**		**1370**		**2410**		**2490**	
						716		**601**		**732**		**2870**		**2820**	
						999		**655**		**1020**		**2390**		**1990**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 12.4	U	< 12.6	U	< 10.6	U	< 10.6	U	**53.1**	
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.9	UJ-	< 6.2	UJ-	< 5.1	U	< 5.1	U	< 5.8	UJ-
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.9	UJ-	< 6.2	UJ-	< 5.1	U	< 5.1	U	< 5.8	UJ-
Benzene	mg/kg			0.04	c,**l	< 0.030	UJ-	< 0.031	UJ-	**0.0036**	J	< 0.026	U	< 0.029	UJ-
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.2	UJ-	< 1.2	UJ-	< 1.0	U	< 1.0	U	< 1.2	UJ-
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.059	UJ-	< 0.062	UJ-	< 0.051	U	< 0.051	U	< 0.058	UJ-
m&p-Xylene	mg/kg					< 0.12	UJ-	< 0.12	UJ-	< 0.10	U	< 0.10	U	< 0.12	UJ-
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.059	UJ-	< 0.062	UJ-	< 0.051	U	< 0.051	U	< 0.058	UJ-
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.71	UJ-	< 0.75	UJ-	< 0.61	U	< 0.62	U	< 0.69	UJ-
o-Xylene	mg/kg					< 0.059	UJ-	< 0.062	UJ-	< 0.051	U	< 0.051	U	< 0.058	UJ-
Toluene	mg/kg			10	n,l	< 0.059	UJ-	< 0.062	UJ-	< 0.051	U	< 0.051	U	< 0.058	UJ-
Total Purgeable Hydrocarbo	mg/kg					< 11.9	UJ-	< 12.5	UJ-	< 10.2	U	< 10.3	U	< 11.5	UJ-
Xylenes, Total	mg/kg			70	n,dc	< 0.18	UJ-	< 0.19	UJ-	< 0.15	U	< 0.15	U	< 0.17	UJ-

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1102SE106		BIMT1102SE107		BIMT1102SE108		LAMT1026SE101		LAMT1026SE102	
					Sample Date	11/2/2011		11/2/2011		11/2/2011		10/26/2011		10/26/2011	
					Start Depth (in)	0		0		6		0		0	
					End Depth (in)	4		6		10		7		4	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**15.7**		**6.6**		**15.1**		**28.0**		**26.6**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
1,2-Diphenylhydrazine	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
1-Methylnaphthalene	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2,4,5-Trichlorophenol	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2,4-Dinitrophenol	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2,6-Dinitrotoluene	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2-Chloronaphthalene	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
2-Nitroaniline	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
2-Nitrophenol	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
3&4-Methylphenol	mg/kg					< 0.783	U	< 0.704	U	< 0.775	U	< 0.914	U	< 0.899	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.795	U	< 0.715	U	< 0.786	U	< 0.928	U	< 0.913	U
3-Nitroaniline	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
4-Chloro-3-Methylphenol	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
4-Chloroaniline	mg/kg					< 0.392	U	< 0.352	UJ-	< 0.387	U	< 0.457	U	< 0.45	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
4-Nitroaniline	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
4-Nitrophenol	mg/kg					< 2.02	U	< 1.81	U	< 2	U	< 2.35	U	< 2.32	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Anthracene	mg/kg	0.05720	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Benzo(b)fluoranthene	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	UJ-	< 0.45	UJ-
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.392	U	< 0.352	U	< 0.387	U	**4.03**		< 0.45	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Carbazole	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Chrysene	mg/kg	0.1660	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	BIMT1102SE106		BIMT1102SE107		BIMT1102SE108		LAMT1026SE101		LAMT1026SE102	
					Sample Date	11/2/2011		11/2/2011		11/2/2011		10/26/2011		10/26/2011	
					Start Depth (in)	0		0		6		0		0	
					End Depth (in)	4		6		10		7		4	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Di-n-Octyl Phthalate	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Fluorene	mg/kg	0.07740	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Isophorone	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Naphthalene	mg/kg	0.1760	h			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Nitrobenzene	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
N-Nitrosodimethylamine	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.795	U	< 0.715	U	< 0.786	U	< 0.928	U	< 0.913	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Phenol	mg/kg	0.4200	f,3,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
Pyrene	mg/kg	0.1950	h,B			< 0.392	U	< 0.352	U	< 0.387	U	< 0.457	U	< 0.45	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0118	U	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Anthracene	mg/kg	0.05720	h,B			**0.0071**	J	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			**0.0173**		< 0.0107	UJ	< 0.0118	U	< 0.0138	U	< 0.0136	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			**0.0148**		< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Benzo(b)fluoranthene	mg/kg					**0.0180**		< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			**0.0075**	J	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Chrysene	mg/kg	0.1660	h,B			**0.0138**		< 0.0107	UJ	< 0.0118	U	< 0.0138	U	< 0.0136	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0118	U	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Fluoranthene	mg/kg	0.4230	h,B			**0.0458**		< 0.0107	UJ	< 0.0118	U	< 0.0138	U	< 0.0136	U
Fluorene	mg/kg	0.07740	h,B			< 0.0118	U	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			**0.0061**	J	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Naphthalene	mg/kg	0.1760	h			< 0.0118	U	< 0.0107	U	< 0.0118	U	< 0.0138	U	< 0.0136	U
Pyrene	mg/kg	0.1950	h,B			**0.0330**		< 0.0107	UJ	< 0.0118	U	< 0.0138	U	< 0.0136	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**1120**		**2510**		**6670**		**2210**		**2370**	
Total Organic Carbon	mg/kg					**820**		**2480**		**9410**		**2070**		**2480**	
						1070		**2970**		**6450**		**2610**		**2070**	
						1160		**2450**		**4740**		**1950**		**2710**	
						1450		**2150**		**6090**		**2230**		**2210**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 11.8	U	< 10.6	U	< 11.7	U	< 13.8	U	< 13.6	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.6	UJ-	< 5.3	U	< 5.8	U	< 6.9	U	< 6.7	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.6	UJ-	< 5.3	U	< 5.8	U	< 6.9	U	< 6.7	U
Benzene	mg/kg			0.04	c,**l	< 0.028	UJ-	< 0.026	U	< 0.029	U	< 0.035	U	< 0.034	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.1	UJ-	< 1.1	U	< 1.2	U	< 1.4	U	< 1.3	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.056	UJ-	< 0.053	U	< 0.058	U	< 0.069	U	< 0.067	U
m&p-Xylene	mg/kg					< 0.11	UJ-	< 0.11	U	< 0.12	U	< 0.14	U	< 0.13	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.056	UJ-	< 0.053	U	< 0.058	U	< 0.069	U	< 0.067	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.68	UJ-	< 0.63	U	< 0.70	U	< 0.83	U	< 0.81	U
o-Xylene	mg/kg					< 0.056	UJ-	< 0.053	U	< 0.058	U	< 0.069	U	< 0.067	U
Toluene	mg/kg			10	n,l	< 0.056	UJ-	< 0.053	U	< 0.058	U	< 0.069	U	< 0.067	U
Total Purgeable Hydrocarbo	mg/kg					< 11.3	UJ-	< 10.6	U	< 11.6	U	< 13.8	U	< 13.5	U
Xylenes, Total	mg/kg			70	n,dc	< 0.17	UJ-	< 0.16	U	< 0.17	U	< 0.21	U	< 0.20	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1026SE103		LAMT1026SE105		LAMT1026SE106		LAMT1027SE101		LAMT1027SE102	
					Sample Date	10/26/2011		10/26/2011		10/26/2011		10/27/2011		10/27/2011	
					Start Depth (in)	0		0		6		0		6	
					End Depth (in)	6		6		10		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**9.1**		**16.3**		**5.5**		**3.8**		**6.2**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
1,2-Diphenylhydrazine	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
1-Methylnaphthalene	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2,4,5-Trichlorophenol	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2,4-Dinitrophenol	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2,6-Dinitrotoluene	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2-Chloronaphthalene	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
2-Nitroaniline	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
2-Nitrophenol	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
3&4-Methylphenol	mg/kg					< 0.726	U	< 0.786	U	< 0.698	U	< 0.686	U	< 0.703	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.737	U	< 0.798	U	< 0.709	U	< 0.697	U	< 0.714	U
3-Nitroaniline	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
4,6-Dinitro-2-methylphenol	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
4-Chloro-3-Methylphenol	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
4-Chloroaniline	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
4-Nitroaniline	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
4-Nitrophenol	mg/kg					< 1.87	U	< 2.03	U	< 1.8	U	< 1.77	U	< 1.81	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Anthracene	mg/kg	0.05720	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Benzo(b)fluoranthene	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.363	UJ-	< 0.393	UJ-	< 0.349	UJ-	< 0.343	UJ-	< 0.352	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Carbazole	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Chrysene	mg/kg	0.1660	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1026SE103		LAMT1026SE105		LAMT1026SE106		LAMT1027SE101		LAMT1027SE102	
					Sample Date	10/26/2011		10/26/2011		10/26/2011		10/27/2011		10/27/2011	
					Start Depth (in)	0		0		6		0		6	
					End Depth (in)	6		6		10		6		12	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Di-n-Octyl Phthalate	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Fluorene	mg/kg	0.07740	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	UJ-	< 0.352	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Isophorone	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Naphthalene	mg/kg	0.1760	h			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Nitrobenzene	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
N-Nitrosodimethylamine	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.737	U	< 0.798	U	< 0.709	U	< 0.697	U	< 0.714	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Phenol	mg/kg	0.4200	f,3,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
Pyrene	mg/kg	0.1950	h,B			< 0.363	U	< 0.393	U	< 0.349	U	< 0.343	U	< 0.352	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Anthracene	mg/kg	0.05720	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Benzo(b)fluoranthene	mg/kg					< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Chrysene	mg/kg	0.1660	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Fluorene	mg/kg	0.07740	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Naphthalene	mg/kg	0.1760	h			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
Pyrene	mg/kg	0.1950	h,B			< 0.0110	U	< 0.0120	U	< 0.0106	U	< 0.0104	U	< 0.0107	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**2140**		**4770**		**1190**		**1460**		**1030**	
Total Organic Carbon	mg/kg					**1620**		**4710**		**1230**		**859**		**708**	
						1360		**5470**		**1690**		**2460**		**981**	
						2790		**4430**		**975**		**1450**		**931**	
						2770		**4470**		**871**		**1080**		**1490**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 10.8	U	< 11.9	U	< 10.3	U	< 10.3	U	< 10.7	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.4	U	< 6.0	U	< 5.1	U	< 5.1	U	< 5.3	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.4	U	< 6.0	U	< 5.1	U	< 5.1	U	< 5.3	U
Benzene	mg/kg			0.04	c,**l	< 0.027	U	< 0.030	U	< 0.025	U	< 0.026	U	< 0.026	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.1	U	< 1.2	U	< 1.0	U	< 1.0	U	< 1.1	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.054	U	< 0.060	U	< 0.051	U	< 0.051	U	< 0.053	U
m&p-Xylene	mg/kg					< 0.11	U	< 0.12	U	< 0.10	U	< 0.10	U	< 0.11	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	**0.012**	J	< 0.060	U	< 0.051	U	**0.015**	J	< 0.053	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.65	U	< 0.72	U	< 0.61	U	< 0.62	U	< 0.63	U
o-Xylene	mg/kg					< 0.054	U	< 0.060	U	< 0.051	U	< 0.051	U	< 0.053	U
Toluene	mg/kg			10	n,l	< 0.054	U	< 0.060	U	< 0.051	U	< 0.051	U	< 0.053	U
Total Purgeable Hydrocarbo	mg/kg					< 10.8	U	< 11.9	U	< 10.2	U	< 10.3	U	< 10.5	U
Xylenes, Total	mg/kg			70	n,dc	< 0.16	U	< 0.18	U	< 0.15	U	< 0.15	U	< 0.16	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1027SE103		LAMT1027SE104		LAMT1027SE105		LAMT1027SE106		LAMT1027SE107	
					Sample Date	10/27/2011		10/27/2011		10/27/2011		10/27/2011		10/27/2011	
					Start Depth (in)	12		0		6		0		0	
					End Depth (in)	18		6		11		6		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**14.9**		**11.2**		**6.3**		**31.3**		**12.4**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
1,2-Diphenylhydrazine	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
1-Methylnaphthalene	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2,4,5-Trichlorophenol	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2,4-Dinitrophenol	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2,6-Dinitrotoluene	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2-Chloronaphthalene	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
2-Nitroaniline	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
2-Nitrophenol	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
3&4-Methylphenol	mg/kg					< 0.773	U	< 0.741	U	< 0.704	U	< 0.958	U	< 0.753	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.785	U	< 0.752	U	< 0.715	U	< 0.972	U	< 0.765	U
3-Nitroaniline	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
4,6-Dinitro-2-methylphenol	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
4-Chloro-3-Methylphenol	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
4-Chloroaniline	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
4-Chlorophenyl Phenyl Ether	mg/kg		B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
4-Nitroaniline	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
4-Nitrophenol	mg/kg					< 1.99	U	< 1.91	U	< 1.81	U	< 2.47	U	< 1.94	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Anthracene	mg/kg	0.05720	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Benzo(b)fluoranthene	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	**9.41**	D
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Carbazole	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Chrysene	mg/kg	0.1660	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1027SE103		LAMT1027SE104		LAMT1027SE105		LAMT1027SE106		LAMT1027SE107	
					Sample Date	10/27/2011		10/27/2011		10/27/2011		10/27/2011		10/27/2011	
					Start Depth (in)	12		0		6		0		0	
					End Depth (in)	18		6		11		6		6	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Di-n-Octyl Phthalate	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Fluorene	mg/kg	0.07740	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Isophorone	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Naphthalene	mg/kg	0.1760	h			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Nitrobenzene	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
N-Nitrosodimethylamine	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.785	U	< 0.752	U	< 0.715	U	< 0.972	U	< 0.765	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Phenol	mg/kg	0.4200	f,3,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
Pyrene	mg/kg	0.1950	h,B			< 0.387	U	< 0.37	U	< 0.352	U	< 0.479	U	< 0.377	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Anthracene	mg/kg	0.05720	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Benzo(b)fluoranthene	mg/kg					< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Chrysene	mg/kg	0.1660	h,B			< 0.0118	U	**0.0237**		**0.0213**		< 0.0146	U	< 0.0114	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Fluorene	mg/kg	0.07740	h,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Naphthalene	mg/kg	0.1760	h			< 0.0118	U	< 0.0112	U	< 0.0106	U	< 0.0146	U	< 0.0114	U
Pyrene	mg/kg	0.1950	h,B			< 0.0118	U	**0.0135**		**0.0111**		< 0.0146	U	< 0.0114	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**8170**		**11500**		**6560**		**12100**		**2570**	
Total Organic Carbon	mg/kg					**5980**		**10400**		**5740**		**11500**		**2160**	
						8640		**10600**		**5920**		**9850**		**1980**	
						10900		**8340**		**5760**		**15400**		**2800**	
						7230		**16600**		**8800**		**11700**		**3330**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l			**450**	J+	**375**					
C19-C36 Aliphatics	mg/kg			20000	n,dc			**618**	J+	**314**					
C9-C18 Aliphatics	mg/kg			200	n,dc			**164**	J+	**106**					
Total Extractable Hydrocarb	mg/kg			200		< 11.5	U	**1230**		**795**		**7.9**	J	< 11.2	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.8	U	< 5.5	U	< 5.1	U	< 7.1	U	< 5.6	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.8	U	< 5.5	U	< 5.1	U	< 7.1	U	< 5.6	U
Benzene	mg/kg			0.04	c,**l	< 0.029	U	< 0.027	U	< 0.026	U	< 0.036	U	< 0.028	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.2	U	< 1.1	U	< 1.0	U	< 1.4	U	< 1.1	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.058	U	< 0.055	U	< 0.051	U	< 0.071	U	< 0.056	U
m&p-Xylene	mg/kg					< 0.12	U	< 0.11	U	< 0.10	U	< 0.14	U	< 0.11	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	**0.016**	J	< 0.055	U	**0.013**	J	**0.022**	J	< 0.056	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.69	U	**0.039**	J	**0.049**	J	< 0.86	U	< 0.67	U
o-Xylene	mg/kg					< 0.058	U	< 0.055	U	< 0.051	U	< 0.071	U	< 0.056	U
Toluene	mg/kg			10	n,l	< 0.058	U	< 0.055	U	< 0.051	U	< 0.071	U	< 0.056	U
Total Purgeable Hydrocarbo	mg/kg					< 11.6	U	< 11.0	U	< 10.2	U	< 14.3	U	< 11.1	U
Xylenes, Total	mg/kg			70	n,dc	< 0.17	U	< 0.16	U	< 0.15	U	< 0.21	U	< 0.17	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1027SE108		LAMT1027SE109		LAMT1027SE110		LAMT1027SE111		LAMT1027SE112	
					Sample Date	10/27/2011		10/27/2011		10/27/2011		10/27/2011		10/27/2011	
					Start Depth (in)	6		12		0		6		12	
					End Depth (in)	12		18		6		12		18	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**6.7**		**3.7**		**15.6**		**14.2**		**18.4**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
1,2-Diphenylhydrazine	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
1-Methylnaphthalene	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2,4,5-Trichlorophenol	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2,4-Dinitrophenol	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2,6-Dinitrotoluene	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2-Chloronaphthalene	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
2-Nitroaniline	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
2-Nitrophenol	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
3&4-Methylphenol	mg/kg					< 0.927	U	< 0.686	U	< 0.782	U	< 0.769	U	< 0.809	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.941	U	< 0.696	U	< 0.794	U	< 0.781	U	< 0.821	U
3-Nitroaniline	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
4-Chloro-3-Methylphenol	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
4-Chloroaniline	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
4-Nitroaniline	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
4-Nitrophenol	mg/kg					< 2.39	U	< 1.77	U	< 2.01	U	< 1.98	U	< 2.08	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Anthracene	mg/kg	0.05720	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Benzo(b)fluoranthene	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.463	U	< 0.343	U	< 0.391	U	**0.237**	J	< 0.405	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Carbazole	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Chrysene	mg/kg	0.1660	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1027SE108		LAMT1027SE109		LAMT1027SE110		LAMT1027SE111		LAMT1027SE112	
					Sample Date	10/27/2011		10/27/2011		10/27/2011		10/27/2011		10/27/2011	
					Start Depth (in)	6		12		0		6		12	
					End Depth (in)	12		18		6		12		18	
					Sample Type	Normal		Normal		Normal		Normal		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Di-n-Octyl Phthalate	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Fluorene	mg/kg	0.07740	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Isophorone	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Naphthalene	mg/kg	0.1760	h			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Nitrobenzene	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
N-Nitrosodimethylamine	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.941	U	< 0.696	U	< 0.794	U	< 0.781	U	< 0.821	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Phenol	mg/kg	0.4200	f,3,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
Pyrene	mg/kg	0.1950	h,B			< 0.463	U	< 0.343	U	< 0.391	U	< 0.385	U	< 0.405	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Anthracene	mg/kg	0.05720	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Benzo(b)fluoranthene	mg/kg					< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Chrysene	mg/kg	0.1660	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Fluorene	mg/kg	0.07740	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Naphthalene	mg/kg	0.1760	h			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
Pyrene	mg/kg	0.1950	h,B			< 0.0107	U	< 0.0103	U	< 0.0118	U	< 0.0117	U	< 0.0123	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**1160**		**970**		**3680**		**7880**		**9380**	
Total Organic Carbon	mg/kg					**1300**		**1050**		**3890**		**9470**		**9240**	
						1010		**1040**		**3630**		**8420**		**11000**	
						1050		**798**		**3540**		**5990**		**8340**	
						1270		**992**		**3680**		**7630**		**8940**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 10.5	U	< 10.4	U	< 11.7	U	< 11.3	U	< 12.2	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.3	U	< 5.2	U	< 6.0	U	< 5.7	U	< 6.1	U
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.3	U	< 5.2	U	< 6.0	U	< 5.7	U	< 6.1	U
Benzene	mg/kg			0.04	c,**l	< 0.026	U	< 0.026	U	< 0.030	U	< 0.028	U	< 0.030	U
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.1	U	< 1.0	U	< 1.2	U	< 1.1	U	< 1.2	U
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.053	U	< 0.052	U	< 0.060	U	< 0.057	U	< 0.061	U
m&p-Xylene	mg/kg					< 0.11	U	< 0.10	U	< 0.12	U	< 0.11	U	< 0.12	U
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.053	U	< 0.052	U	< 0.060	U	< 0.057	U	< 0.061	U
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.63	U	< 0.63	U	**0.030**	J	< 0.68	U	< 0.73	U
o-Xylene	mg/kg					< 0.053	U	< 0.052	U	**0.022**	J	**0.0065**	J	< 0.061	U
Toluene	mg/kg			10	n,l	< 0.053	U	< 0.052	U	< 0.060	U	< 0.057	U	< 0.061	U
Total Purgeable Hydrocarbo	mg/kg					< 10.6	U	< 10.4	U	< 12.0	U	< 11.4	U	< 12.1	U
Xylenes, Total	mg/kg			70	n,dc	< 0.16	U	< 0.16	U	< 0.18	U	< 0.17	U	< 0.18	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1028SE101		LAMT1028SE102		LAMT1101SE101		LAMT1101SE102		LAMT1101SE103	
					Sample Date	10/28/2011		10/28/2011		11/1/2011		11/1/2011		11/1/2011	
					Start Depth (in)	0		6		0		0		0	
					End Depth (in)	6		11		4.5		5		5	
					Sample Type	Normal		Normal		Normal		Field Duplicate		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
% Moisture															
Percent Moisture	%					**4.4**		**3.2**		**14.5**		**9.1**		**27.2**	
EPA 8270															
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
1,2-Diphenylhydrazine	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
1-Methylnaphthalene	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2,4,5-Trichlorophenol	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2,4-Dinitrophenol	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2,6-Dinitrotoluene	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2-Chloronaphthalene	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
2-Nitroaniline	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
2-Nitrophenol	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
3&4-Methylphenol	mg/kg					< 0.69	U	< 0.682	U	< 0.772	U	< 0.726	U	< 0.907	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 0.701	U	< 0.692	U	< 0.783	U	< 0.737	U	< 0.92	U
3-Nitroaniline	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
4,6-Dinitro-2-methylphenol	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
4-Chloro-3-Methylphenol	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
4-Chloroaniline	mg/kg					< 0.345	U	< 0.341	U	< 0.386	UJ-	< 0.363	U	< 0.453	U
4-Chlorophenyl Phenyl Ethe	mg/kg		B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
4-Nitroaniline	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
4-Nitrophenol	mg/kg					< 1.78	U	< 1.76	U	< 1.99	U	< 1.87	U	< 2.33	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Anthracene	mg/kg	0.05720	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Benzo(b)fluoranthene	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Carbazole	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Chrysene	mg/kg	0.1660	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1028SE101		LAMT1028SE102		LAMT1101SE101		LAMT1101SE102		LAMT1101SE103	
					Sample Date	10/28/2011		10/28/2011		11/1/2011		11/1/2011		11/1/2011	
					Start Depth (in)	0		6		0		0		0	
					End Depth (in)	6		11		4.5		5		5	
					Sample Type	Normal		Normal		Normal		Field Duplicate		Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Di-n-Octyl Phthalate	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Fluorene	mg/kg	0.07740	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Isophorone	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Naphthalene	mg/kg	0.1760	h			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Nitrobenzene	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
N-Nitrosodimethylamine	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 0.701	U	< 0.692	U	< 0.783	U	< 0.737	U	< 0.92	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Phenol	mg/kg	0.4200	f,3,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
Pyrene	mg/kg	0.1950	h,B			< 0.345	U	< 0.341	U	< 0.386	U	< 0.363	U	< 0.453	U
EPA 8270 by SIM															
Acenaphthene	mg/kg	0.006700	c,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Anthracene	mg/kg	0.05720	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Benzo(b)fluoranthene	mg/kg					< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Chrysene	mg/kg	0.1660	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Fluorene	mg/kg	0.07740	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Naphthalene	mg/kg	0.1760	h			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
Pyrene	mg/kg	0.1950	h,B			< 0.0105	U	< 0.0103	U	< 0.0117	U	< 0.0110	U	< 0.0137	U
EPA 9060															
Mean Total Organic Carbon	mg/kg					**1810**		**878**		**784**		**4990**		**3110**	
Total Organic Carbon	mg/kg					**1810**		**918**		**818**		**5050**		**2680**	
						1470		**845**		**744**		**6400**		**2880**	
						2300		**817**		**907**		**4650**		**2980**	
						1640		**932**		**666**		**3870**		**3880**	
MADEP EPH															
C11-C22 Aromatics	mg/kg			400	n,l										
C19-C36 Aliphatics	mg/kg			20000	n,dc										
C9-C18 Aliphatics	mg/kg			200	n,dc										
Total Extractable Hydrocarb	mg/kg			200		< 10.4	U	< 10.2	U	< 11.5	U	< 10.8	U	< 13.3	U
MADEP VPH															
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	< 5.2	U	< 5.2	U	< 5.7	U	< 5.2	UJ-	< 6.6	UJ-
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	< 5.2	U	< 5.2	U	< 5.7	U	< 5.2	UJ-	< 6.6	UJ-
Benzene	mg/kg			0.04	c,**l	< 0.026	U	< 0.026	U	< 0.029	U	< 0.026	UJ-	< 0.033	UJ-
C9-C10 Aromatics	mg/kg			100	n,dc	< 1.0	U	< 1.0	U	< 1.1	U	< 1.0	UJ-	< 1.3	UJ-
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.052	U	< 0.052	U	< 0.057	U	< 0.052	UJ-	< 0.066	UJ-
m&p-Xylene	mg/kg					< 0.10	U	< 0.10	U	< 0.11	U	< 0.10	UJ-	< 0.13	UJ-
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.052	U	< 0.052	U	< 0.057	U	< 0.052	UJ-	< 0.066	UJ-
Naphthalene	mg/kg	0.1760	h	4	n,dc	< 0.62	U	< 0.62	U	< 0.69	U	< 0.62	UJ-	< 0.79	UJ-
o-Xylene	mg/kg					< 0.052	U	< 0.052	U	< 0.057	U	< 0.052	UJ-	< 0.066	UJ-
Toluene	mg/kg			10	n,l	< 0.052	U	< 0.052	U	< 0.057	U	< 0.052	UJ-	< 0.066	UJ-
Total Purgeable Hydrocarbo	mg/kg					< 10.3	U	< 10.3	U	< 11.5	U	< 10.4	UJ-	< 13.2	UJ-
Xylenes, Total	mg/kg			70	n,dc	< 0.15	U	< 0.15	U	< 0.17	U	< 0.16	UJ-	< 0.20	UJ-

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1101SE104	
					Sample Date	11/1/2011	
					Start Depth (in)	0	
					End Depth (in)	5.5	
					Sample Type	Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**
% Moisture							
Percent Moisture	%					**34.5**	
EPA 8270							
1,2,4-Trichlorobenzene	mg/kg	2.100	a,b,1,B			< 0.502	U
1,2-Dichlorobenzene	mg/kg	0.01650	a,b,1,B			< 0.502	U
1,2-Diphenylhydrazine	mg/kg					< 2.59	U
1,3-Dichlorobenzene	mg/kg	4.430	a,b,1,B			< 0.502	U
1,4-Dichlorobenzene	mg/kg	0.5990	a,b,1,B			< 0.502	U
1-Methylnaphthalene	mg/kg					< 0.502	U
2,4,5-Trichlorophenol	mg/kg					< 2.59	U
2,4,6-Trichlorophenol	mg/kg	0.2130	a,b,1			< 0.502	U
2,4-Dichlorophenol	mg/kg	0.1170	a,b,1			< 0.502	U
2,4-Dimethylphenol	mg/kg	0.02900	f,3			< 0.502	U
2,4-Dinitrophenol	mg/kg					< 2.59	U
2,4-Dinitrotoluene	mg/kg	0.04160	a,b,1			< 0.502	U
2,6-Dinitrotoluene	mg/kg					< 0.502	U
2-Chloronaphthalene	mg/kg					< 0.502	U
2-Chlorophenol	mg/kg	0.03120	a,b,1			< 0.502	U
2-Methylnaphthalene	mg/kg	0.02020	c			< 0.502	U
2-Methylphenol(o-Cresol)	mg/kg					< 0.502	U
2-Nitroaniline	mg/kg					< 2.59	U
2-Nitrophenol	mg/kg					< 0.502	U
3&4-Methylphenol	mg/kg					< 1	U
3,3'-Dichlorobenzidine	mg/kg	0.1270	a,b,1			< 1.02	U
3-Nitroaniline	mg/kg					< 2.59	U
4,6-Dinitro-2-methylphenol	mg/kg					< 2.59	U
4-Bromophenyl Phenyl Ethe	mg/kg	1.230	a,b,1,B			< 0.502	U
4-Chloro-3-Methylphenol	mg/kg					< 0.502	U
4-Chloroaniline	mg/kg					< 0.502	U
4-Chlorophenyl Phenyl Ether	mg/kg		B			< 0.502	U
4-Nitroaniline	mg/kg					< 2.59	U
4-Nitrophenol	mg/kg					< 2.59	U
Acenaphthene	mg/kg	0.006700	c,B			< 0.502	U
Acenaphthylene	mg/kg	0.005900	c,B			< 0.502	U
Anthracene	mg/kg	0.05720	h,B			< 0.502	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.502	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.502	U
Benzo(b)fluoranthene	mg/kg					< 0.502	U
Benzo(g,h,i)Perylene	mg/kg	0.1700	g,B			< 0.502	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.502	U
Bis(2-Chloroethoxy)methane	mg/kg					< 0.502	U
Bis(2-Chloroethyl)ether	mg/kg					< 0.502	U
bis(2-Chloroisopropyl) ether	mg/kg					< 0.502	U
Bis(2-Ethylhexyl)phthalate	mg/kg	0.1800	k			< 0.502	U
Butylbenzylphthalate	mg/kg	10.90	a,b,1			< 0.502	U
Carbazole	mg/kg					< 0.502	U
Chrysene	mg/kg	0.1660	h,B			< 0.502	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.502	U
Dibenzofuran	mg/kg	0.4150	a,b,1			< 0.502	U
Diethyl Phthalate	mg/kg	0.6030	a,b,1			< 0.502	U

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

					Sample ID	LAMT1101SE104	
					Sample Date	11/1/2011	
					Start Depth (in)	0	
					End Depth (in)	5.5	
					Sample Type	Normal	
Chemical	**Units**	**Freshwater Sediment[1]**	**Supporting Note[1]**	**RBSL[2]**	**Supporting Note[2]**	**Result**	**Qual**
Dimethyl Phthalate	mg/kg					< 0.502	U
Di-N-Butyl Phthalate	mg/kg	6.470	a,b,1			< 0.502	U
Di-n-Octyl Phthalate	mg/kg					< 0.502	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.502	U
Fluorene	mg/kg	0.07740	h,B			< 0.502	U
Hexachloro-1,3-Butadiene	mg/kg		B			< 0.502	U
Hexachlorobenzene	mg/kg	0.02000	g,4,B			< 0.502	U
Hexachloroethane	mg/kg	1.027	a,b,1,B			< 0.502	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.502	U
Isophorone	mg/kg					< 0.502	U
Naphthalene	mg/kg	0.1760	h			< 0.502	U
Nitrobenzene	mg/kg					< 0.502	U
N-Nitrosodimethylamine	mg/kg					< 0.502	U
N-Nitroso-di-n-propylamine	mg/kg					< 0.502	U
N-nitrosodiphenylamine	mg/kg	2.680	a,b,1			< 0.502	U
Pentachlorophenol	mg/kg	0.5040	a,b,1,B			< 1.02	U
Phenanthrene	mg/kg	0.2040	h,B			< 0.502	U
Phenol	mg/kg	0.4200	f,3,B			< 0.502	U
Pyrene	mg/kg	0.1950	h,B			< 0.502	U
EPA 8270 by SIM							
Acenaphthene	mg/kg	0.006700	c,B			< 0.0152	U
Anthracene	mg/kg	0.05720	h,B			< 0.0152	U
Benzo(a)Anthracene	mg/kg	0.1080	h,B			< 0.0152	U
Benzo(a)Pyrene	mg/kg	0.1500	h,B			< 0.0152	U
Benzo(b)fluoranthene	mg/kg					< 0.0152	U
Benzo(k)Fluoranthene	mg/kg	0.2400	g,B			< 0.0152	U
Chrysene	mg/kg	0.1660	h,B			< 0.0152	U
Dibenzo(a,h)Anthracene	mg/kg	0.03300	h,B			< 0.0152	U
Fluoranthene	mg/kg	0.4230	h,B			< 0.0152	U
Fluorene	mg/kg	0.07740	h,B			< 0.0152	U
Indeno(1,2,3-cd)Pyrene	mg/kg	0.01700	j,9,B			< 0.0152	U
Naphthalene	mg/kg	0.1760	h			< 0.0152	U
Pyrene	mg/kg	0.1950	h,B			< 0.0152	U
EPA 9060							
Mean Total Organic Carbon	mg/kg					**5810**	
Total Organic Carbon	mg/kg					**5420** **6600** **6020** **5220**	
MADEP EPH							
C11-C22 Aromatics	mg/kg			400	n,l	**67.4**	
C19-C36 Aliphatics	mg/kg			20000	n,dc	**77.2**	
C9-C18 Aliphatics	mg/kg			200	n,dc	**22.2**	
Total Extractable Hydrocarb	mg/kg			200		**202**	J+
MADEP VPH							
Aliphatic (C05-C08), Adjuste	mg/kg			60	n,dc	**1.4**	J-
Aliphatic (C09-C12), Adjuste	mg/kg			100	n,dc	**1.8**	J-
Benzene	mg/kg			0.04	c,**l	< 0.037	UJ-
C9-C10 Aromatics	mg/kg			100	n,dc	**2.2**	J-
Ethylbenzene	mg/kg	1.100	a,b,1	6.000	c,dc	< 0.073	UJ-
m&p-Xylene	mg/kg					< 0.15	UJ-
Methyl-Tert-Butylether	mg/kg			0.08000	c,*l	< 0.073	UJ-
Naphthalene	mg/kg	0.1760	h	4	n,dc	**0.46**	J-
o-Xylene	mg/kg					**0.027**	J-
Toluene	mg/kg			10	n,l	**0.47**	J-
Total Purgeable Hydrocarbo	mg/kg					**7.0**	J-
Xylenes, Total	mg/kg			70	n,dc	< 0.22	UJ-

Table 5
October 2011 Downstream Sediment Sampling Data Summary Report
Sediment Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

Notes:

This table was generated using data validated by ARCADIS in February 2012.

1. U.S. Environmental Protection Agency Freshwater Sediment Screening Benchmarks (USEPA 2006)

2. Risk-Based Screening Level - Tier 1 Surface Soil (0 - 2 feet below ground surface), within 10 feet of the water table (MDEQ 2009)

Exceedances of USEPA Freshwater Sediment Screening Benchmarks - shaded
Exceedances of MDEQ Tier-1 Residential Risk Based Screening Levels - underlined
Detections - boldfaced
- = Results may be biased low
+ = Results may be biased high
D = Concentration is based on a diluted sample analysis
EPA = Environmental Protection Agency
EPH = extractable petroleum hydrocarbons
in = inches

J = The compound was positively identified; however, the associated numerical value is an estimated concentration only
MADEP = Massachusetts Department of Environmental Protection
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
Qual = Laboratory Qualifier
R = Sample result is rejected due to quality control problems
U = The chemical was not detected above the reporting limit shown or is considered non-detect due to associated blank contamination
UJ = The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation
VPH = volatile petroleum hydrocarbons

USEPA Freshwater Sediment Screening Benchmarks Supporting Notes:

1	Value derived from the EqP method with Region III BTAG freshwater values (2004[a]) and logKow values from Karickhoff and Long (1995[b]). Only logKow values between 2 and 6 were used, as suggested by the EPA (2000[o]).
3	Apparent Effects Threshold (AET) marine value from Washington State Sediment Quality Standards as cited by Jones et al. (1997[f]).
4	Lowest Effect Level (LEL).
9	ARCs TEL (Assessment and Remediation of Contaminated Sediments Program Threshold Effects Level - 28d test using Hyallela azteca from U.S. EPA (1996[h]).
a	Region III BTAG Freshwater Screening Benchmarks. 2004. http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/screenbench.htm
b	Karickhoff, S.W. and J.M. Long. Environmental Research Laboratory. U.S. EPA.1995. Internal Report on Summary of Measured, Calculated and Recommended Log K_{ow} Values.
B	Bioaccumulative

c CCME (Canadian Council of Ministers of the Environment). 2003. Canadian Environmental Quality Guidelines: Summary Table December 2003. Canadian Council of Ministers of the Environment, Winnipeg, Manitoba. Available at http://www.ccme.ca/publications/ceqg_rcqe.html

f Jones, D.S., G.W. Suter II and R.N. Hull. 1997. Toxicological benchmarks for screening contaminants of potential concern for effects on sediment-associated biota: 1997 Revision. ES/ER/TM-95/R4. Oak Ridge National Laboratory, Oak Ridge, TN. Available at: http://www.esd.ornl.gov/programs/ecorisk/documents/tm95r4.pdf

g Persaud, D., R. Jaagumagi and A. Hayton. 1993. Guidelines for the protection and management of aquatic sediment quality in Ontario. Ontario Ministry of the Environment. Queen's Printer of Ontario.

h MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ.

j Ingersoll, C.G., P.S. Haverland, E.L. Brunson, T.J. Canfield, F.J. Dwyer, C.E. Henke, N.E. Kemble, D.R. Mount, and R.G. Fox. 1996. Calculation and evaluation of sediment effect concentrations for the amphipod Hyallela azteca and the midge Chironomus riparius. International Association of Great Lakes Research. 22:602-623.

k MacDonald, D.D., C.G. Ingersoll, D.E. Smrong, R.A. Lindskoog, G. Sloane, T. Biernacki. 2003. Development and evaluation of numerical sediment quality assessment guidelines for Florida inland waters. Florida Department of Environmental Protection. Available at: http://www.dep.state.fl.us/water/monitoring/docs/seds/SQAGs_for_Florida_Inland_Waters_01_03.PDF

Risk-Based Screening Levels - Tier 1 Surface Soil (0-2') - <10 ft to Groundwater Notes:

*	The best achievable practical quantitation limit (0.20) is greater than the RBSL;
**	The best achievable practical quantitation limit (0.05) is greater than the RBSL;
c	Carcinogenic and direct contact RBSLs are based on a cancer risk of $1X10^{-6}$ for a total
dc	Residential direct contact including ingestion, inhalation, and dermal
l	Leaching from soil to groundwater
n	Non-carcinogenic and direct contact RBSLs are based on a hazard quotient of 0.123 for

Table 6
October 2011 Downstream Sediment Sampling Data Summary Report
Surface Water Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

				Sample ID	BIMT1031SW101		BIMT1031SW102		BIMT1102SW101		BIMT1102SW102	
				Sample Date	10/31/2011		10/31/2011		11/2/2011		11/2/2011	
Chemical	**Units**	**DEQ-7 Aquatic Acute**	**DEQ-7 Aquatic Chronic**	**DEQ-7 Human Health Standards - Surface Water**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 2540												
Total Suspended Solids	mg/l				206		215		5.6		44.8	
MADEP EPH												
Total Extractable Hydrocarbons	µg/l				< 212	U	< 201	U	< 222	U	< 210	U
MADEP VPH												
Aliphatic (C05-C08), Adjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C05-C08), Unadjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C09-C12), Adjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C09-C12), Unadjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Benzene	µg/l			5.000	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
C9-C10 Aromatics	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Ethylbenzene	µg/l			530.0	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
m&p-Xylene	µg/l				< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Methyl Tertiary-Butyl Ether	µg/l			30.00	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Naphthalene	µg/l			100.0	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
o-Xylene	µg/l			10000	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Toluene	µg/l			1000	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Total Purgeable Hydrocarbons	µg/l				< 20.0	U	< 20.0	U	< 20.0	U	< 20.0	U
Xylenes, Total	µg/l			10000	< 1.5	U	< 1.5	U	< 1.5	U	< 1.5	U

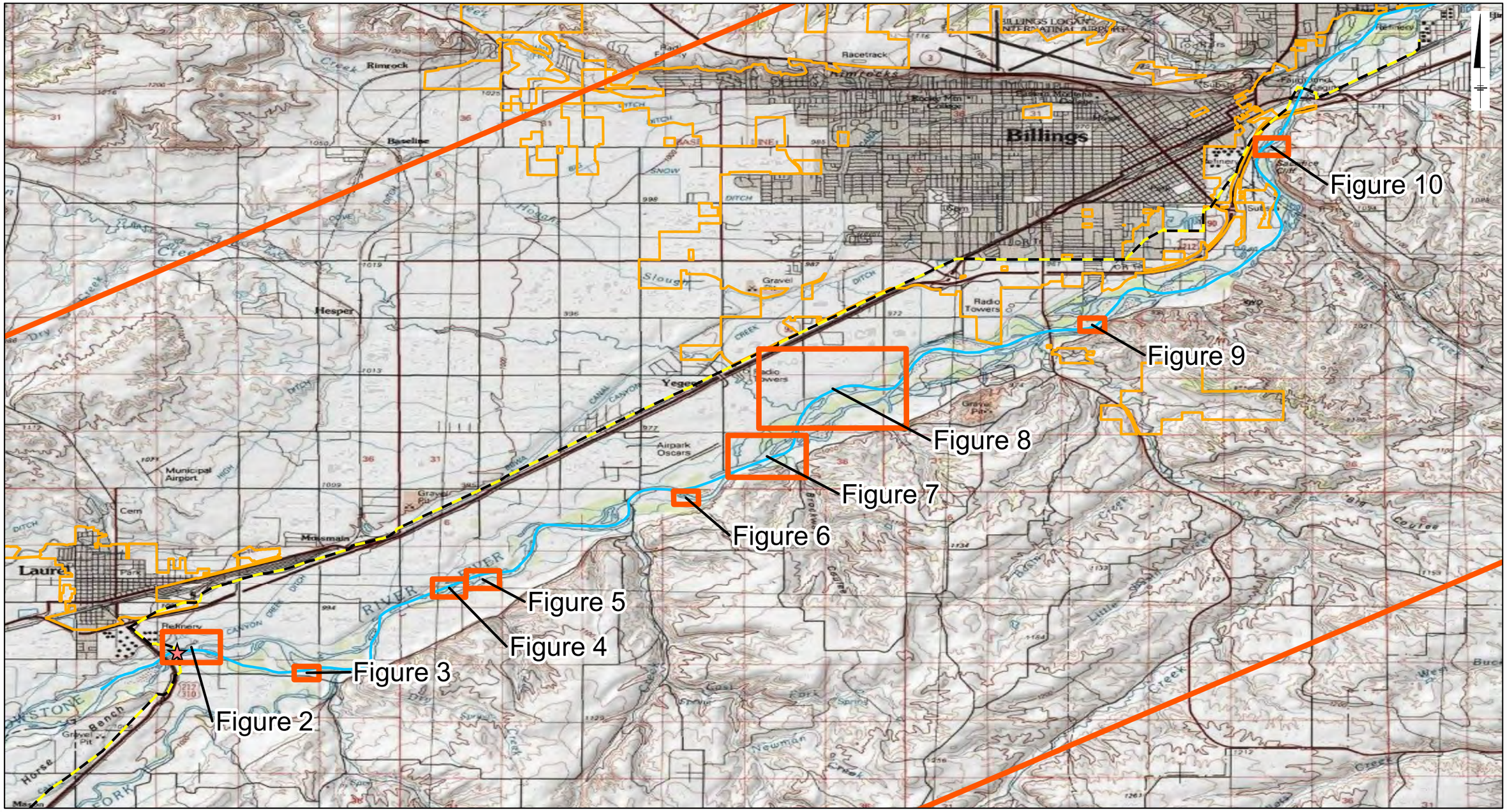
Notes:
1. There are no results that exceed the DEQ-7 Human Health Standards - Surface Water.
2. There are no DEQ-7 Aquatic Life Standards Acute or Chronic screening values for the chemicals analyzed.
DEQ-7 = Montana Department of Environmental Quality Circular DEQ-7 Montana Numeric Water Quality Standards (MDEQ 2010).
EPA = Environmental Protection Agency
EPH = extractable petroleum hydrocarbons
MADEP = Massachusetts Department of Environmental Protection
mg/l = milligrams per liter
µg/l = micrograms per liter
VPH = volatile petroleum hydrocarbons
Qual = Laboratory Qualifier

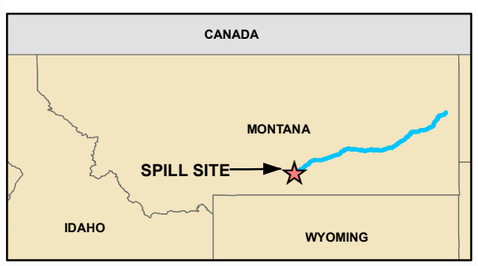
Table 6
October 2011 Downstream Sediment Sampling Data Summary Report
Surface Water Sample Analytical Results
Silvertip Pipeline Incident
Laurel, Montana

				Sample ID	LAMT1101SW101		LAMT1101SW102		LAMT1101SW103	
				Sample Date	11/1/2011		11/1/2011		11/1/2011	
Chemical	**Units**	**DEQ-7 Aquatic Acute**	**DEQ-7 Aquatic Chronic**	**DEQ-7 Human Health Standards - Surface Water**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
EPA 2540										
Total Suspended Solids	mg/l				11.7		24.1		7.4	
MADEP EPH										
Total Extractable Hydrocarbons	µg/l				< 202	U	< 205	U	< 201	U
MADEP VPH										
Aliphatic (C05-C08), Adjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C05-C08), Unadjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C09-C12), Adjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Aliphatic (C09-C12), Unadjusted	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Benzene	µg/l			5.000	< 0.50	U	< 0.50	U	< 0.50	U
C9-C10 Aromatics	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Ethylbenzene	µg/l			530.0	< 0.50	U	< 0.50	U	< 0.50	U
m&p-Xylene	µg/l				< 1.0	U	< 1.0	U	< 1.0	U
Methyl Tertiary-Butyl Ether	µg/l			30.00	< 0.50	U	< 0.50	U	< 0.50	U
Naphthalene	µg/l			100.0	< 5.0	U	< 5.0	U	< 5.0	U
o-Xylene	µg/l			10000	< 0.50	U	< 0.50	U	< 0.50	U
Toluene	µg/l			1000	< 0.50	U	< 0.50	U	0.12	J
Total Purgeable Hydrocarbons	µg/l				< 20.0	U	< 20.0	U	< 20.0	U
Xylenes, Total	µg/l			10000	< 1.5	U	< 1.5	U	< 1.5	U

Notes:
1. There are no results that exceed the DEQ-7 Human Health Standards - Surface Water.
2. There are no DEQ-7 Aquatic Life Standards Acute or Chronic screening values for the chemicals analyzed.

DEQ-7 = Montana Department of Environmental Quality Circular DEQ-7 Montana Numeric Water Quality Standards (MDEQ 2010).
EPA = Environmental Protection Agency
EPH = extractable petroleum hydrocarbons
MADEP = Massachusetts Department of Environmental Protection
mg/l = milligrams per liter
µg/l = micrograms per liter
VPH = volatile petroleum hydrocarbons
Qual = Laboratory Qualifier





LEGEND:

- SPILL SITE
- PIPELINE
- YELLOWSTONE RIVER CENTERLINE (APPROXIMATE)
- CITY BOUNDARY

0 2 4 Miles

GRAPHIC SCALE

NOTES:

1. BASEMAPPING TOPOGRAPHIC MAP PROVIDED BY ESRI ARCGIS ONLINE MAP SERVICE.
2. YELLOWSTONE RIVER CENTERLINE APPROXIMATED FROM 2009 AERIAL IMAGERY.

SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

YELLOWSTONE RIVER STUDY AREA

ARCADIS

FIGURE
1

City: SYR Div/Group: 90 Created By: mkohberger Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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LEGEND:

Sampling Locations

- SPILL SITE
- PIPELINE
- SEDIMENT SAMPLES REQUESTED BY EMES

0 350 700 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

NOTES:

1. AERIALS: IMAGERY WAS ACQUIRED JULY 20 - 21, 2011. 4-BAND DIGITAL AERIAL PHOTOGRAPHY, 1-FOOT PIXEL RESOLUTION.
2. " BGS = INCHES BELOW GROUND SURFACE
3. EPH = EXTRACTABLE PETROLEUM HYDROCARBONS
4. TEH = TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS
5. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
6. SVOC = SEMI-VOLATILE ORGANIC COMPOUNDS
7. USEPA BTAG FS SB = UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 3 BIOLOGICAL TECHNICAL ASSISTANCE GROUP FRESHWATER SEDIMENT SCREENING BENCHMARKS
8. MDEQ TIER-1 RESIDENTIAL RBSL = MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY TIER-1 RESIDENTIAL RISK-BASED SCREENING LEVELS
9. ONLY PARAMETERS WITH RESULTS ABOVE REPORTING LIMITS ARE SHOWN IN DATABOXES. RESULTS BELOW REPORTING LIMITS (I.E. NOT DETECTED) ARE NOT SHOWN.
10. ANALYTICAL RESULTS PRESENTED IN THE DATABOXES HAVE BEEN VALIDATED.
11. J = THE COMPOUND WAS POSITIVELY IDENTIFIED; HOWEVER, THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY.
12. D = CONCENTRATION IS BASED ON A DILUTED SAMPLE ANALYSIS.
13. - = RESULTS MAY BE BIASED LOW
14. + = RESULTS MAY BE BIASED HIGH
15. THE TARGET DEPTH OF 1.5 FEET WAS ACHIEVED AT ALL LOCATIONS WITH THE EXCEPTIONS TO THIS NOTED IN TABLE 2.

SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
2

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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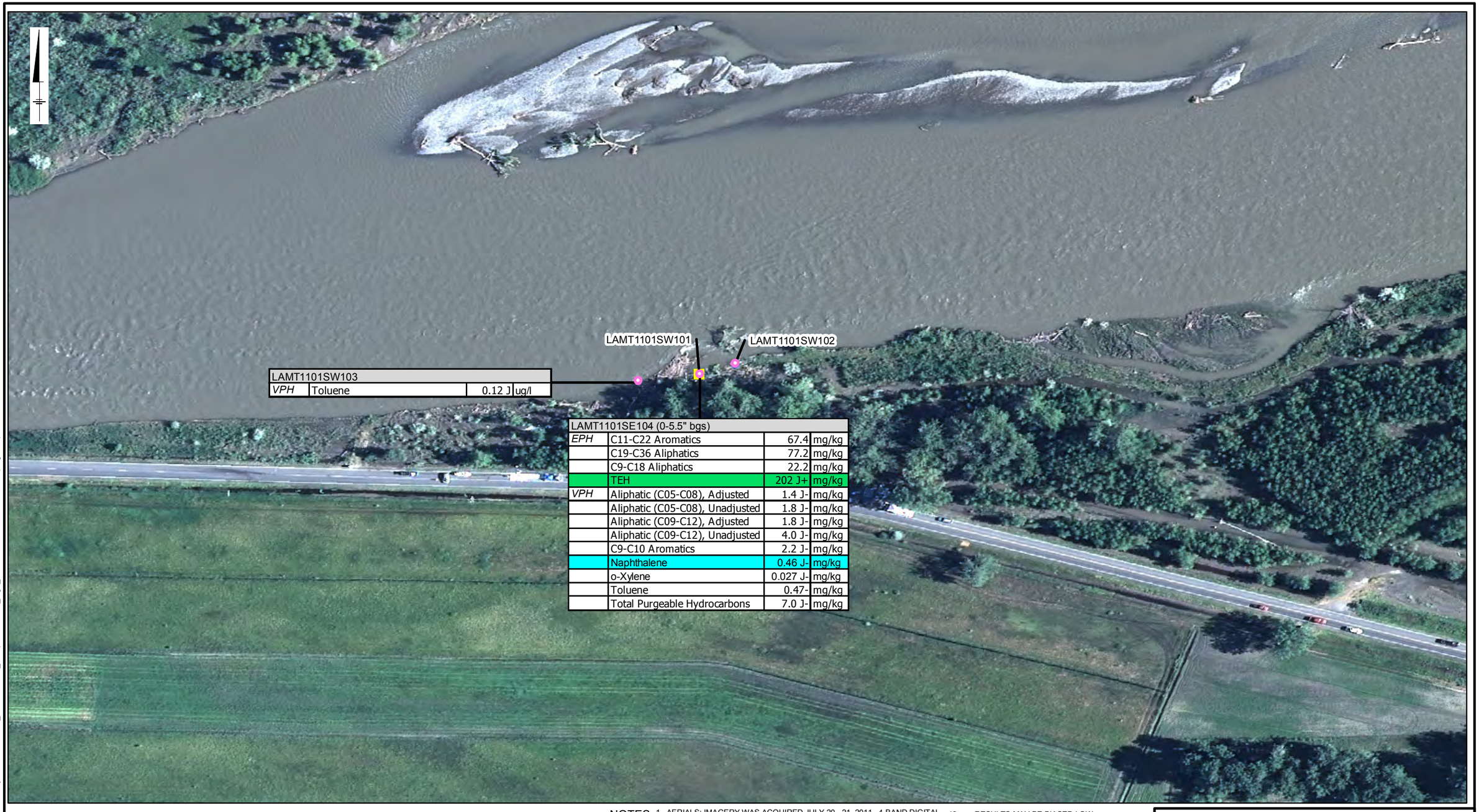

LAMT1101SW103			
VPH	Toluene	0.12 J	ug/l

LAMT1101SE104 (0-5.5" bgs)			
EPH	C11-C22 Aromatics	67.4	mg/kg
	C19-C36 Aliphatics	77.2	mg/kg
	C9-C18 Aliphatics	22.2	mg/kg
	TEH	202 J+	mg/kg
VPH	Aliphatic (C05-C08), Adjusted	1.4 J-	mg/kg
	Aliphatic (C05-C08), Unadjusted	1.8 J-	mg/kg
	Aliphatic (C09-C12), Adjusted	1.8 J-	mg/kg
	Aliphatic (C09-C12), Unadjusted	4.0 J-	mg/kg
	C9-C10 Aromatics	2.2 J-	mg/kg
	Naphthalene	0.46 J-	mg/kg
	o-Xylene	0.027 J-	mg/kg
	Toluene	0.47-	mg/kg
	Total Purgeable Hydrocarbons	7.0 J-	mg/kg

LEGEND:

Sampling Locations

- SPILL SITE
- DEBRIS PILE SEDIMENT SAMPLES
- SURFACE WATER SAMPLES

0 150 300 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

NOTES:

1. AERIALS: IMAGERY WAS ACQUIRED JULY 20 - 21, 2011. 4-BAND DIGITAL AERIAL PHOTOGRAPHY, 1-FOOT PIXEL RESOLUTION.
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8. MDEQ TIER-1 RESIDENTIAL RBSL = MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY TIER-1 RESIDENTIAL RISK-BASED SCREENING LEVELS
9. ONLY PARAMETERS WITH RESULTS ABOVE REPORTING LIMITS ARE SHOWN IN DATABOXES. RESULTS BELOW REPORTING LIMITS (I.E. NOT DETECTED) ARE NOT SHOWN.
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14. + = RESULTS MAY BE BIASED HIGH
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SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
3

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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LEGEND:

Sampling Locations

- DEBRIS PILE SEDIMENT SAMPLES

0 200 400 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

NOTES:

1. AERIALS: IMAGERY WAS ACQUIRED JULY 20 - 21, 2011. 4-BAND DIGITAL AERIAL PHOTOGRAPHY, 1-FOOT PIXEL RESOLUTION.
2. " BGS = INCHES BELOW GROUND SURFACE
3. EPH = EXTRACTABLE PETROLEUM HYDROCARBONS
4. TEH = TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS
5. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
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15. THE TARGET DEPTH OF 1.5 FEET WAS ACHIEVED AT ALL LOCATIONS WITH THE EXCEPTIONS TO THIS NOTED IN TABLE 2.

SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
4

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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LEGEND:

Sampling Locations

- DEBRIS PILE SEDIMENT SAMPLES
- SEDIMENT SAMPLES REQUESTED BY EMES
- SHEEN ON WATER SEDIMENT SAMPLES

0 850 1,700 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

NOTES:
1. AERIALS: IMAGERY WAS ACQUIRED JULY 20 - 21, 2011. 4-BAND DIGITAL AERIAL PHOTOGRAPHY, 1-FOOT PIXEL RESOLUTION.
2. " BGS = INCHES BELOW GROUND SURFACE
3. EPH = EXTRACTABLE PETROLEUM HYDROCARBONS
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5. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
6. SVOC = SEMI-VOLATILE ORGANIC COMPOUNDS
7. USEPA BTAG FS SB = UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 3 BIOLOGICAL TECHNICAL ASSISTANCE GROUP FRESHWATER SEDIMENT SCREENING BENCHMARKS
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15. THE TARGET DEPTH OF 1.5 FEET WAS ACHIEVED AT ALL LOCATIONS WITH THE EXCEPTIONS TO THIS NOTED IN TABLE 2.

SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
5

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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LEGEND:

Sampling Locations

- SEDIMENT SAMPLES REQUESTED BY EMES
- SURFACE WATER SAMPLES

0 150 300 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

NOTES:

1. AERIALS: IMAGERY WAS ACQUIRED JULY 20 - 21, 2011. 4-BAND DIGITAL AERIAL PHOTOGRAPHY, 1-FOOT PIXEL RESOLUTION.
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LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
6

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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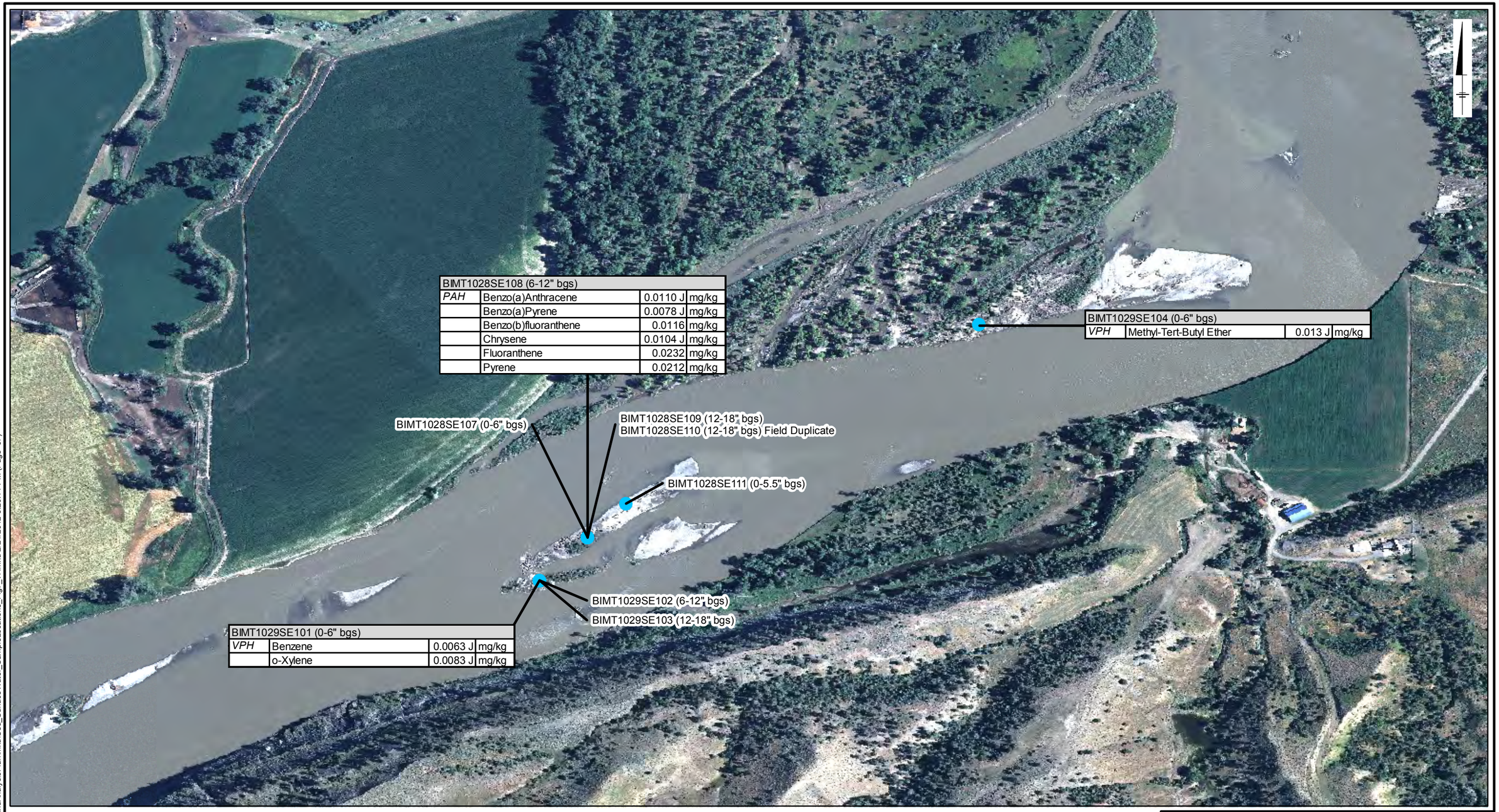

LEGEND:

Sampling Locations

- SHEEN ON WATER SEDIMENT SAMPLES

0 450 900 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

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LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
7

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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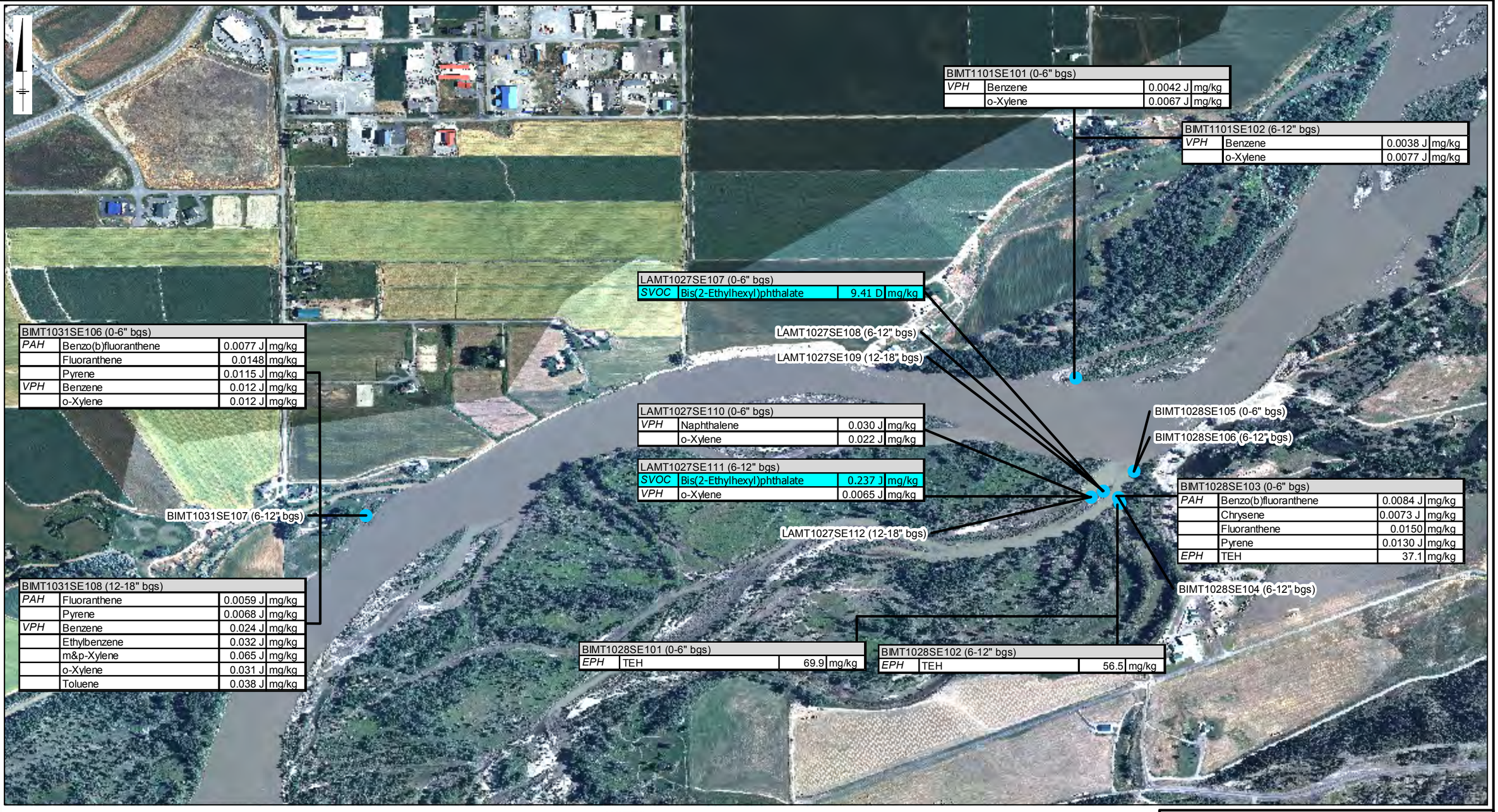

0 900 1,800 Feet

GRAPHIC SCALE

LEGEND:

Sampling Locations

- SHEEN ON WATER SEDIMENT SAMPLES

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

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SILVERTIP PIPELINE INCIDENT RESPONSE
LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
8

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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LEGEND:

Sampling Locations

- SHEEN ON WATER SEDIMENT SAMPLES
- NO ACCESS

0 150 300 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

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LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
9

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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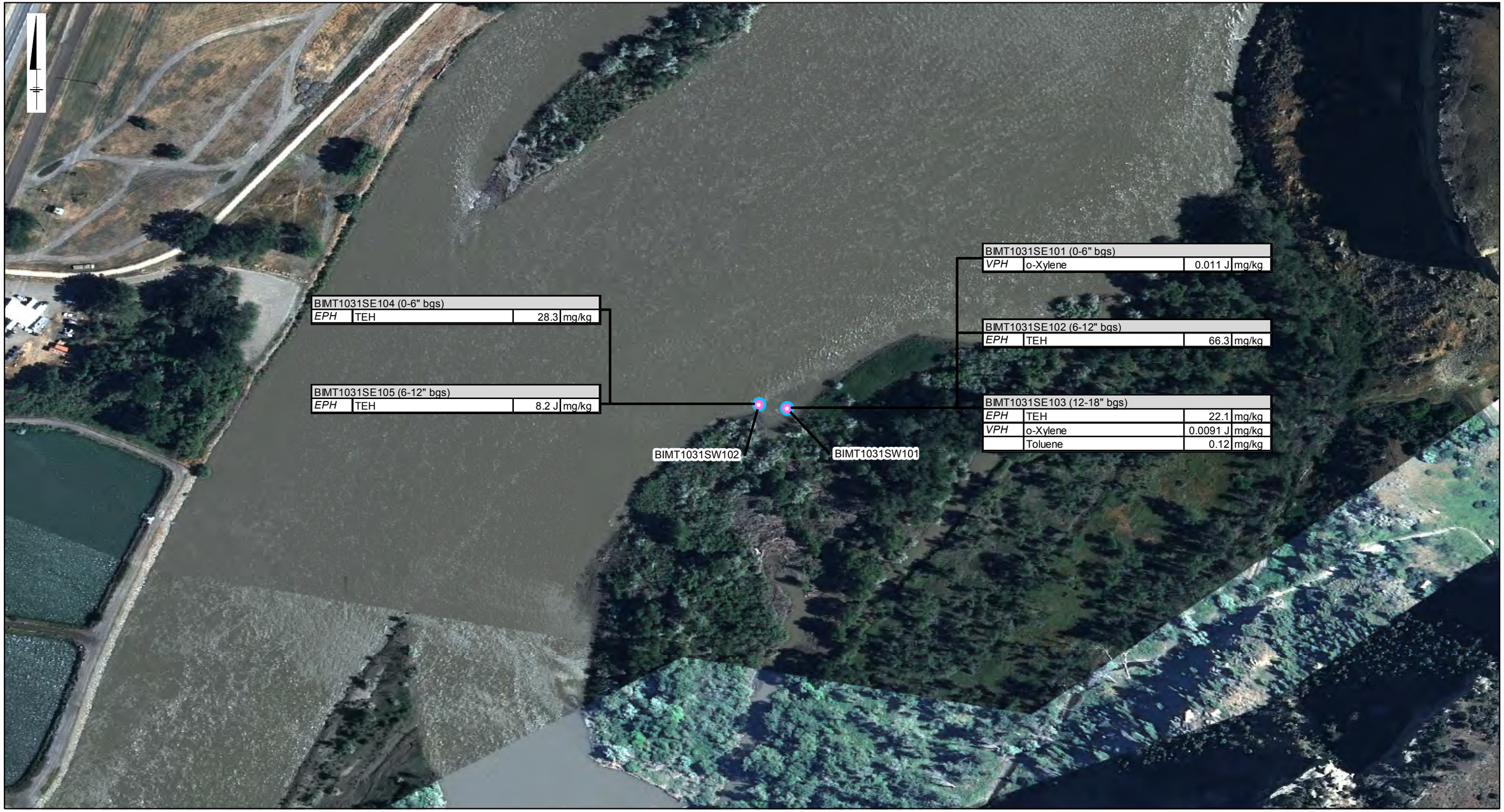

LEGEND:

Sampling Locations

- SHEEN ON WATER SEDIMENT SAMPLES
- SURFACE WATER SAMPLES

0 200 400 Feet

GRAPHIC SCALE

Location ID			
Sample Type (Depth)			
Analyte Group	Analyte Name	Result	Unit
	Exceeds USEPA BTAG FS SB		
	Exceeds MDEQ Tier-1 Residential RBSLs		

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LAUREL, MONTANA
OCTOBER 2011, DOWNSTREAM SEDIMENT
SAMPLING DATA SUMMARY REPORT

SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

ARCADIS

FIGURE
10

City: SYR Div/Group: 90 Created By: j.rapp Last Saved By: mgress
Exxon-Mobil (B0085883.1103.00001)
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Appendix A

October 2011 Downstream Sediment Sampling Field Notes

10/25/11 J. Mayo

1410 Complete sediment sample load trucks

☆ PID reading 0.0

1415 Depart Glendive PWS for Billings.

1715 Arrive in Billings. Complete rinsate blank GLMT1025SW102 time 1350.

1745 Head to IC for H&S meeting

☆1130 Calibrate PID

Fresh Air Cal - 0.0 ppm

Isobutylene Cal - 100.0 ppm

Serial # PGM 7600

Lot # 0928FB11

JMayo

10/26/11 J. Mayo

730 H&S meeting at ARCADIS office

0800 Depart office for shopping for supplies

1000 Meet at Duck Creek Boat launch, load boats

☆1030 Conduct daily H&S tailgate

Personnel: J. Mayo, S. Campbell, N. Pagano (ARCADIS); C. Conn, B. Castner, J. Haven, C. Harris, Y. Girard (WRI) J. (MDEQ).

Weather: sunny, clear. cold.

1100 Depart boat launch for A28. (debris pile).

1115 Arrive at area. Scout area to determine exact sampling location.

1200 3 sample locations (delineation) identified. Area is rough terrain, with cobbles. Some patches of sediment. Grass, debris, tree trunks.

10/26/11 J. Mayo

Begin sampling A28A.
large cobble at 4"
Collect sample LAMT1026SE101/101A
Refusal at 7 inches.
Sample 0-7", time 1200
SOIL LOG: 75% FINE GRAINED
15% SILT, DARK BROWN,
MED DENSE, SATURATED, NO ODOR
OR STAINING OR ORGANICS [0.1 PID]
1215 Collect sample from A28B
LAMT1026SE102/102A
time 1215. Area has shallow
sediment layer over cobbles
Sample is 0-4". Refusal
at 4", water encountered.
85% sand, fines + med grain,
15% silt, dark brown, wet,
loose, Trace gravel [0.1 PID]
1230 COLLECT SAMPLE FROM A28C
LAMT1026SE103/103A
TIME 1230. AREA IS
POCKET OF SILTY SAND
DEPOSIT OVERLYING GRAVEL
& COBBLE MIX. AREA IS
~4' FROM DEBRIS PILE.

J. Mayo 10/26/11

REFUSAL @ 6".
SOIL LOG: 100% MEDIUM-
COARSE GRAINED SAND, TRACE
SILT, LIGHT BROWN, MOIST
TRACE GRAVEL, LOOSE. [0.1 = PID]
1300 Depart for Duck Creek Boat
launch
1305 Arrive at launch; break
for lunch
1400 Return to launch. Depart for
A21
1415 Scout area. A21 is on an
island with lots of debris.
1430 Call Jesse Starr about
~~where~~ JAM 10/24 where to sample due
to large amounts of debris.
1515 Determine A21A location.
Area is sandy with large
debris (logs, tree trunks) surrounding
the area.
1530. Collect sample. LAMT1026SE104/104A
time 1530. Refusal at 6".
sample 0-6" only.
1535 Attempt #2, refusal at 6".

10/26/11 J. Mayo

SOIL LOG: 85% FINE SAND 15% SILT, MOIST BROWN, MED DENSE, ORGANICS (STEMS).

1540 Jesse Starr called. Sampling plan adjusted. Sample 102A will not be analyzed. Navigate to debris pile, choose 3 target locations (delineation). First (SE-A21A) is sandy, near debris. No vegetation.

1545 Collect sample LAMT1026SE105/105A. Sample 0-6". PID=1.4

1600 Continue augering. hit refusal at 10 inches. Collect sample LAMT1026SE106/106A time 1600

Soil log 0-6":
60% fine grained sand, 40% silt, tanish-brown, med-dense, moist.

Log 6-10":
90% M-C SAND, 10% SILT LOOSE, MOIST, BROWN, NO ORGANICS, ODOR, STAIN.

PID = 1.1

10/26/11 J. Mayo

★ 1015 Calibrate PID:
Freshair cal: 0.0 ppm
Isobutylene cal: 100.0 ppm
Serial #: P6M7600
Lot #: 0928FB11

1620 Depart A21 for duck creek boat launch.

1635 Arrive at duck creek.

1645 load trucks and depart for storage shed.

1655 Arrive at storage shed, Pack coolers, organize coolers/equipment for tomorrow. Complete rinsate blank LAMT1026SW101 time

1800 call into daily H&S meeting

1830 Depart storage shed

1855 Arrive at ARCADIS office

J Mayo

10/27/11 J Mayo

Personnel: J. Mayo, N. Pagano, S. Campbell (ARCADIS), C. Conn, B. Castner, J. Haven, Y. Girard (WRI) L. Alvey (MDEQ)

weather: clear skies, cold. 40° F

0820 Arrive at duck creek. boat launch. Load boats

0850 Conduct Health and Safety daily meeting.

0905 Depart Duck creek for A21

0915 Arrive at A21.

0925 Begin sampling at A21B (delineation sample).
Sample LAMT1027SE101/101A
0-6". Soil log: 100% med-coarse sand. dark brown, moist, loose. organics: root (trace).

0940 Collect 6-12" sample at A21B LAMT1027SE102 Soil log: 100% med-coarse sand, trace silt, loose, moist, trace organics (roots).

0950 Collect 12-18" sample

10/27/11 J. Mayo

LAMT1027SE103/103A time 0950. Soil log: 80% silt, 20% fine grained sand, med plasticity, brown, moist, organics (roots) trace. PID readings: 0-6" 0.0 ppm
6-12" 0.1 ppm
12-18" 0.1 ppm

1005 Move to A21C, collect 0-6" sample LAMT1027104/104A. Soil log: 60% silt, 40% fine grained sand, trace med grained sand, brown, moist, loose. Trace organics (roots). Area is sandy, with lots of wood

1015 Collect 6-11" sample. Refusal at 11". LAMT1027SE105/105A Soil log: ~~60% silt,~~ JAM 10/27/11 Same as above.

Sample complete. Pack up boats.

PID readings: 0-6": 0.0 ppm; 6-11": 0.0 ppm

* note: photo indicates 6-12 inches, sample

10/27/11 J Mayo

is only to 11" due to refusal.
1030 Complet sampling, load boats
1045 Depart A21 for A22.
1055 Scout area, move boats closer to target. Arrive at target
1110 Collect sample at A22. refusal at 6". 5 attemps made, could not get deeper than 6". LAMT1027SE106 Soil log: 85% silt, 15% fine grained sand. Med plasticity, soft, trace organics (roots leaves) wet. PID reading 0.4 ppm
1125 Complete sampling. Load boats, Call J. Starr. will skip B2. ~~Move on to B46~~. Drive to duck creek for lunch break.
1255 Depart duck creek for B46A.
1305 Arrive at B46A. Scout area. Determine A & B locations will be on island, C, D, E will be on shoreline across the Chanel.

10/27/11 J. Mayo

1335 B46A area is sandy with shrubs. little debris. Oil fine visible on shrubs. No evidence of impacted soils, MDEQ chose location based on proximity to coordinates and oil line.
Soil log: 90% fine grained sand 10% silt, dark brown, slight moisture, loose.
JAM 10/27/11 ~~1305~~ Sample @ 0-6" LAMT1027SE107/107A. PID: 1.5 ppm time = 1340
1355: Collect 6-12" sample. LAMT1027SE108/108A. Soil log: same as above. PID: 0.9 ppm
1405 Collect 12-18" sample LAMT1027SE109/109A PID: 0.9 ppm Soil log: same as above. Background PID: 0.1 ppm.
1455 Collect B46B Sample. Area is sandy, near shrubs. Collect 0-6" sample: LAMT1027SE110/110A soil log: 40% silt, 60% fine-grained sand, some organic matter (roots) dark brown, light moisture. PID: 0.6 ppm

10/27/11 J. Mayo

1505 Collect 6-12" sample
LAMT1027SE111/111A soil log:
40% silt, 60% fine grained
sand dark brown, moist,
med dense, organics (roots)
PID: 0.9

1515 Collect 12-18" sample
LAMT1027SE112 soil log:
same as above; PID: ND ppm

1530 Pack up boats. Head to car
at Airstrip (N. Pagano, J. Mayo)
WRI and S. Campbell to
duck creek.

1545 Arrive at storage shed.
QA/QC sample coolers,
re-pack with ice. PACK SAMPLE
KITS FOR NEXT DAY. RESTOCK
DI WATER, GARBAGE BAGS, + TAPE.

1430 MOB TO LAB TO Pick UP 8 oz
JARS + EXTRA SETS ENCORES

1505 ARRIVE @ ARCADIS OFFICE
FOR MEETING.

5/5

10/28/11 J. Mayo

0845 All members at Billings
air Strip.
Personnel: S. Campbell, N. Pagano,
J. Mayo (ARCADIS). J. Gutting
(MDEQ)
weather: hazy, cold ~35°
0900 Scout B46 for sampling
location
0930 Collect 0-6" sample at B46
BIMT1028SE101/101A. Area
is next to channel, muddy,
ice is on the water.
Soil log: 100% silt, trace fine
grained sand, dark brown
mottled w/ dark gray, soft,
wet. PID: 0.2 ppm
0945 Collect 6-12" sample
BIMT1028SE102. Soil log:
100% silt, trace fine grained
sand. dark gray, soft, wet
organics (roots). PID: 0.3 ppm
0955: Began to auger. Hit refusal.
Probed/tested multiple other areas
within 4ft. Refusal everywhere.

1/8

10/28/11 J-Mayo

Move to next location.

* 0845 calibrate PID:
fresh air cal 0.0 ppm
span cal 100.0 ppm
SN # PGM7600
Lot # 0928FB11

1010 Select B46D location. Area is similar to B46C: muddy along shoreline, ice on water.

1015 Collect BIMT1028SE103/103A. (0-6")
soil log: 100% silt, trace fine grained sand. dark gray, soft, wet, organics (loose)
PID: 0.4 ppm

1030 Collect 6-12" sample BIMT1028SE104/104A soil log: same as above; some roots. PID: 0.6 ppm
refusal reached at 12" due to rocks and organic debris (roots).

1045 Scout B46E. Area is close where WRI and air boats were docked during July–Sept. Area is sloping bank. No

2/6

10/28/11 J Mayo

vegetation. Hard mud.

1050 Collect 0-6" sample at B46E. BIMT1028SE105/105A
soil log: 95% silt, 5% very fine-fined grained sand, brown, moist. some organics (roots) med. plasticity

1100: Collect 6-10" sample.
BIMT1028SE106/106A. Refusal reached at 10 inches. Probed in surrounding area, suspected rip rap under sediment based on surrounding area.
soil log: same as above, but 85% silt, 15% very fine-fine grained sand.
PID: 0-6": 0.8 ppm; 6-10" 0.6 ppm

1115 Pack up trucks. drive to duck creek boat launch to meet boat crew. Break for lunch

1225 Depart launch for A27.

1235 Arrive at A27, scout area.

1315 Area is in back area that was flooded during high flows. Cobbles with some debris. Found "pond", probed. organic sheen visible. MDEQ agreed, did not want to sample that area.

3/6

10/28/11 J. Mayo

1330 Collect 0-6" sample LAMT1028SE101/101A soil log: 90% fine-medium grained sand 10% silt, trace organics (leaves). loose, dry. PID: 0.9 ppm Field blank collected: LAMT1028SE103

13 time: 1345

~~1335~~: Collect 6-11" sample. LAMT1028SE102/

1340 102A, Hit refusal on rocks. MDEQ expressed she expected this and accepted that as the final sample. Soil log: same as above, but no organics. PID: 0.5 ppm

1350 Complete sampling, walk back to boat.

1400 Depart for B8A.

1410 Arrive at B8A. Scout area and find sampling location.

1430 Area is sandy, with some shrubs. Many logs/stick debris. MDEQ agreed with sample location

1445 Collect 0-6" sample BIMT1028SE107/107A.. soil log: 70% fine grained sand, 30% silt, light brown moist. PID: 0.1 ppm

4/6

10/28/11 J. Mayo

1450 Collect 6-12" sample BIMT1028SE108/108A.. Soil log: 70% fine grained sand 30% silt. Brown, med dense, moist. PID: 0.3

1505 Collect 12-18 sample BIMT1028SE109/109A soil log: 80% fine grained sand, 20% silt, moist, med dense. Brown. PID: 0.4 ppm Collect duplicate sample: BIMT1028SE110 time: 1510. Finish sample. Navigate to B8B.

1515 Select sampling location. Area is sandy, and near a debris pile.

1530 Collect sample BIMT1028SE111/111A. Sample is 0-5.5". Hit refusal at 5.5". Probed in multiple areas (~10) however refusal at all areas. MDEQ requested specific location due to proximity to debris pile and likelihood of oil collection.

5/6

10/28/11 J. Mayo

soil log: 100% med-coarse grained sand, trace fine-grained sand, trace gravel, moist, loose. tan, brown, black speckels.
PID: 0.4 ppm

1540 Pack up boats.
1550 Depart B8 for duck Creek boat launch.
1610 Arrive at boat launch.
1620 Depart boat launch for storage shed.
1630 Arrive at storage shed. Begin collecting rinsate blanks.
1635 BIMT1028SW101 time 1635 was collected on equipment from 10/27/11.
1640 BIMT1028SW102 time 1640 was collected on 10/28/11 equipment.
1700 Finish ~~collect~~ packing coolers. JAM 10/28/11
1720 depart storage shed for lab. to drop off samples.
6/6 1735. Drop off samples. Return to office

10/29/11 SLipka

8:30 All team members at Duck Creek

Personnel: S. Lipka, S. Campbell
N. Pagano (ARCADIS)
J. Gutling (MDEQ)
Weather - 45-50 Cloudy, very windy

8:45 Safety meeting lead by S. Campbell

9:00 Scout B09 for sampling location. Cobbles and Debris around Sample location

9:20 GPS location
45° 42' 10.195 N
108 36 30.452 W
Sheen on water observation - Sample

Found depressional puddle, probed for Sheen; no Sheen observed

1/4

10/29/11 SLipka

SL 10/29 Location ID: B9A
9:25 Sample ID BIMT1029SE101
Collect 0-6" Area is between debris of logs and cobbles
Soil: 60% Fine grain sand
40% silt
ground, dry, trace organics roots
Brown
PID: 0.1 PPM
SL 10/29

9:45 Collect 6-12" Sample
B9B, BIMT1029SE102
PID: 0.2 PPm
Soil: 70% Silt
30% Fine grain Sand
moist mid dense, Brown
trace organic roots, Soft
9:55 B9C BIMT1029SE103
Collect 12-18"
Soil: 40% Silt
60 Fine - mid Grain sand
Some organics roots, twigs
Brown loose
PID: 0.1 PPM
Finish at 10:20 ~~Move to B1~~ SL 10/29
motor back to Duck Creek for supplies.

2/4

10/29/11 SLipka

10:42 - Arrive at Duck Creek, gather needed supplies.

10:55 Leave Duck Creek for B10.

11:05 Arrive at B10 Scout area for Sampling location.

11:15 Arrive at B10 Sampling location. Area is surrounded by debris, large woody debris. Adjacent to ~~wa~~ shallow water running over a shelf
Location ID: B10A
Sample ID: BIMT1029SE104
45°42' 10.159" N
108° 30' 30.452" W
~~Collect 0-6"~~ SL 10/29
Collect 0-6"
Refusal at 6.5" probed around the area and no area found where sediment is deeper than 6.5".
Soil: 90 mid-coarse Sand no organics
trace Fine Sand
10% silt loose, dry
Brown, grey Black Speckled

3/4

10/29/11 S Lipka

PID 0.0 ppm

11:37 Pack up head to boats
Back to Duck Creek to
meet up w/ Tom Hensen
to Scout new Sampling location.

12:00 Arrive at Duck Creek.

12:30 Depart w/ Tom Hensen to
new Sampling location.
found location.

1300 Depart back to Duck Creek
for lunch.

1400 Stand down due to extreme
wind conditions Drive to Storage Unit

1430 Arrive at Storage unit. Collect
rinsate blanks.

1435 BIMT1029SW101 and BIMT1029SW102

1445 Finish packing coolers leave
Storage unit for ARCADIS
office.

4/4 Shelly Lipka

10/31/11 S Lipka

8:05 All team members at
Duck Creek.
Personnell: S. Lipka, N. Pagano,
S. Campbell; J. Machado (ARCADIS)
J Gutting (MDEQ)
Weather: partly Cloudy, mid 50s
8:30 - Load boats w/ equipment.
Return to storage unit for equipment.
9:10 Leave Duck Creek for B43.
9:35 Arrive at B43, Scout area for sample
location.
9:50 location found. found pools with visible signs
of Sheen. Called J. Stern
told to probe around area.
Area of sheen in cove surrounded
by point w/ cobbles. ~~[illegible]~~ SL 10/31
not much debris. Sediment
Very soft. Upland grassy
w/ trees. Decided to take
water sample along w/
Sediment. Not running water. B43A
Another area with in cove with sheen
and oiling. Not location on
B43B running water through this area.

1/6

10/31

West of Ponded areas, Soil when probed 3-4.5" mixed w/ water produces sheen. area not sampled.

Coordinates. MDEQ asked to take additional sample at this location as it visibly looks more impacted. N. Pagana Call J. Starr about additional location. The plan is to collect Surface water at both locations. ~~SL~~ SL 10/31 Use pads to soak up sheen/oil. Collect Sediment at both locations.

10:20 Collect Sample ~~of~~, Surface water, at pools.

Location ID: B43A

Sample ID: BIMT1031SW101

Water taken from both ponded areas where sheen is visible. More sheen is observed where water is more shallow (western end of the 2 ponds). ~~Surfacs~~ 10/31 SLL

10:45 Collect Sample, surface water, at Cove.

Location ID: B43B

Sample ID: BIMT1031SW102

Surface water taken from areas running water meets larger body of water.

2/6

10/31

S. Lipka

10:58. Sediment Sample at ponded area. at darkan Soil west of the Standing water of ponds.

Location ID: B43A 0-6"

Sample ID: BIMT1031SE101

Soil ~~IDG~~: 80% Silt
20% Fine grained Sand

wet, brown, modeled area w/ dark grey, soft.

PID: 0.2 ppm

11:05 Location ID: B43A 6-12"

Sample ID: BIMT1031SE102

Soil Log: 80% Silt
20% Fine grained Sand

wet, brown, Very soft

PID: 0.4 ppm

11:15 Location ID: B43A 12-18"

Sample ID: BIMT1031SE103

Soil log: 100% Silt trace fine Sand wet Soft Brown, Some organics tree bark.

PID: 0.3 ppm

Completed Sampling at B43A move to B43B.

3/6

11:30 Collect Sediment 0-6"
Location ID: B43B
Sample ID: BI MT 1031SE104
Soil Log: 90% Silt
10% Fine grained Sand
wet, Brown, area around 3" with dark grey trace organics, tree bark.
PID: 0.2 ppm
11:45 Collect Sediment 6-12"
hit refusal at 12"
Location ID: B43B
Sample ID: BI MT 1031SE105
Soil log: 90% Silt
10% Fine grand Sand ~~trace~~ SL 10/31
wet, Brown trace organics: tree bark.
PID: 0.5 ppm

B43A: 45° 47' 02.122 N 108° 28' 36.484" W
B43B: 45° 47' 02.208 N 108° 28' 37.0416" W
12:00 Pack up Samples bring back to Boats. Use pads to clean area B43B. Head back to Duck Creek.

12:30 Arrive at Duck Creek. S. Campbell and Rich (Exxon) take boat ride to see Burn pile. Lunch Break.
1400 Leave Duck Creek for B13.
1430 Arrive at B13, scout area Coordinates ~~pos~~ SL 10/31 put location in middle of ~~oiling~~ 10/31 SL flowing Creek. found location where oiling marks are on trees. MDEQ ok. Surrounded by debris logs, beams tree bark.
B13 45° 43' 10.704" N
108° 35' 46.398" W
1450: Start Sampling at B13 0-6".
Location ID: B13
Sample ID: BI MT 1031SE106
Soil log: 100% Silt, dry, mud dense, Brown PID=0.3 ppm
1505: Sampling B13 6-12"
Location ID: B13
Sample ID: BI MT 1031SE107

10/31 S. Lipka

Sample Soil log:
60% Fine grained Sand
40% Silt
Firm, Brown, dry, trace organics roots
PID: 0.3 ppm

1515 Sample 12-18"
Location ID - B13
Sample ID - BIMT 1031SE108
Soil log: 60% Fine grained Sand
40% Silt
Firm, Brown, dry, Some organics roots.
PID: 0.4 ppm

1520 Finish Sampling at B13 head to boats.

1525 Leave B13 for Duck Creek

1540 Arrive at Duck Creek, pack truck ~~and~~ SL 10/31

1555 Leave duck Creek for Storage Unit.

1605 Arrive at Storage unit pack Coolers and equipment for next day.

1630 Leave Storage unit for H&S meetings at JC.

1700 Safety meeting at JC. 6/6

11/1 S. Lipka

10:20 All team members at Duck Creek.
Personnel: S. Lipka, N. Pagano, S. Campbell, J. Machado (ARCADIS)
Weather: mid 30's, cloudy, wind 5-10 mph. Chance of Snow.

10:50 Depart Duck Creek for A02.

11:10 Arrive at A02, ~~SO~~ SL 11/1 Scout area for sample location.

11:25 Found Both locations:
~~A02 A - I~~ SL 11/1
A02B - 45° 39' 21.431" N
108° 45' 0.966" W
A02A -

11:30 Start Sampling A02B. 0-4.5
Location ID: A02B
Sample ID: LAMT1101SE101
Refusal at 4.5".
Area w/ ~~very~~ many cobbles, large woody debris tree trunks. Sampling area next to over turned tree.
Taking 1 MS/MSD.
PID: 0.0 ppm

11/1 SLJK

Soil log: 100 med-coarse grained San
moist, loose, brown trace gravel.
Area was buldozed and cleared
as observed by S. Campbell
during operations earlier in the
project.

11:48 Finish Sampling at A02B move to
A02A

11:50 Start Sampling at A02A
Area covered with Cobbles Soil
taken next to roots of over-
turned tree. Refusal at 5"

11:58 Location ID: A02A
Sample ID: LAMT1101SE103
Duplicate taken at this location.
~~Soil log:~~ 11/1 SLL
Soil log: 80% med to coarse grained San
20% silt, loose, wet, brown

11:55 PID: 0.0 ppm
~~11:58~~ 11/1 SLL Dup: LAMT1101SE102

12:05 Finish Sampling at A02A, head
back to the Boats.

12:10 Leave A02, travel to A07 to recon
area for future sampling event.

2/5

11/1 S.L.Jka

12:20 Arrive at what is thought to
be the A07 sampling area. Flagged
area ~~not~~ 11/1 SLL found. Swift moving water
on 3 sides of debris.
Sampling area behind overturned
tree and other woody debris
Oil observed on bank on
vegetation, oil line on trees.
Areas where foot impressions
are sheen bubbling out of
Sediment. No sheen observed
on water surface. Tom Henson
indicated that samples to be
taken on 3 points of the debris
p.e. S. Campbell call T. Henson
to inform him that samples can
not be taken due to swift
moving river.
Probed area for worst possible
impacts to take sample.
Sheen bubbling through when probed
Surface water sample to be taken
at pool where sheen bubbled up
after probing.

3/5

11/1 S. Lipka

12:55 Start Surface water Sample at pool.

1300 Location ID: SWA07
Sample ID: LAMT1101SW101

1310 Location ID: SWA07E
Sample ID: LAMT1101SW102

1315 Start Sediment sample at west end of pool. Hit Refusal 5.5". LAMT1101SE104, A07
Soil log: 100% silt trace fine grained Sand. Sheen present, odor strong, wet dark brown
PID: 3.1 ppm

1330 Finish Sediment Sampling

1340 Surface water sample at west end. Taken from side of Boat
Sample ID: LAMT1101SW103
Location ID: SWA07W

1400 Leave A07 for Duck Creek.

1410 Arrive at Duck Creek for quick Snack Break.

1440 Leave Duck Creek for B16.

1455 Arrive at B16, scoot area for sample location.

4/5

1515 Start Sediment Sampling at B16 Area with a lot of Cobbles and in between large woody Debris.

1520 Location ID: B16 0-6"
Sample ID: BIMT1101SE101
Soil log: 100% fine grained Sand grey/tan dry loose trace organics roots.
PID: 0.1 ppm

1525: Location ID: B16 6-12"
Hit refusal at 12".
Sample ID: BIMT1101SE102
Soil log: 90% Fine grained Sand 10% silt loose dry Brown some organics.
PID: 0.0ppm

1530: Finish Sediment Sampling at B16.

1545 Load Boats, head back to Duck Creek

1600 Arrive back at Duck Creek. Load trucks to go to Storage unit and lab for extra equipment.

1645 Arrive at IC for meeting

Shelby Lipka

5/5

11/2/11 SEDIMENT SAMPLING
CALIBRATE PID
FRESH AIR CAL: 0.0 PPM
ISOBUTYLENE CAL: 100.0 PPM
SERIAL #: PGM 7600
AT DUCK CREEK AT 0815.
BOAT STEERING IS FROZEN ON
SUPPORT BOAT. WALKING
WE ORGANIZE NEW SOIL
KITS + PACK BOATS.
0845: H&S MEETING
0915: DEPART FOR BZ
1000: ARRIVE AT PONDS
BREAK UP ICE + START
PROBING FOR SHEEN.
SHEEN OBSERVED ON POND
A. COLLECTING: TOTALS 3
SEDIMENT SAMPLES AT EACH POND.
(1) SAMPLE ON NW SIDE OF
POND. SE-BOZa.
SAMPLE ID: BIMT1102SE101
TIME: 11 20
0-6"
SOIL LOG: 95% FINE SAND
5% SILT BROWN, WET,
TRACE ORGANICS (ROOTS) PID 0.0PPM

11/2/11
1040: 6-11", REFUSAL @ 11".
SAMPLE ID: BIMT1102SE102
TIME: 1040
SOIL LOG:
85% FINE SAND, 15% SILT
BROWN, WET, TRACE
ORGANICS (ROOTS) SOFT.
PID 0.0PPM

1100: SE-BOZb
~~0-6"~~ 0-4" REFUSAL AT 4"
SAMPLE LOCATION: SEBOZb
ID: BIMT1102SE103
TIME 1100 PID 0.1
SOIL LOG: SAME AS ABOVE ~~REFUSAL AT 4"~~
1120: SAMPLE LOCATION
SE-BOZc
ID BIMT1102SE104
TIME 11:20
0-3" PID 0.1
REFUSAL @ 3"
LOG: 60% GRAVEL, 40% M-C SAND
TRACE SILT, MOIST, BROWN,
LOOSE

11/2

1130: MOVE TO POND B
LOCATION: SE-B02D
DEPTH: 0-3" REFUSAL @ 3". GRAVEL
TIME: 1130 PID 0.4
ID: BIMT1102SE105
- SOIL LOG: 50% GRAVEL 50% M-C SAND, TRACE SILT, WET, BROWN, LOOSE SOME ORGANICS (ROOTS)
1140: SE-B02E
DEPTH: 0-4" (REFUSAL @ 4")
TIME: 1140
ID: BIMT1102SE106
LOG: F-M SAND 90% 10% SILT LOOSE, MOIST, BROWN TRACE GRAVEL. PID 0.3
1150: SURFACE WATER SAMPLE FROM POND A: SW-B02A @1150.
1200: SURFACE WATER SAMPLE FROM POND B: SW-B02B @1200
1210: WALK BACK TO BOATS.
1230: BACK AT DUCK CREEK LEAVE FOR LUNCH

11/2

1400 ARRIVE AT B-30
LOCATION IS SANDY BANK WITH VEGETATION.
ID: BIMT1102SE107
DEPTH 0-6"
TIME 1415 PID 0.1
LOG
80% SILT, 20% SAND (F) ~~LOOSE~~ MED DENSE BROWN DRY, TRACE ORGANICS (ROOTS)
1425: BIMT1102SE108
6-10" (REFUSAL @ 10")
TIME 1425
LOG: SAME AS ABOVE BUT SOME ORGANICS (ROOTS)
PID 0.0

1540: ARRIVE AT STORAGE UNIT TO COLLECT RINSATE BLANK + PACK COOLERS FOR LAB DROP OFF.
RINSATE: BIMT1102SW105 @ 1700
TRIP BLANK: BIMT1102SE109
1800: LEAVE STORAGE UNIT.
ALL GEAR UNLOADED COOLERS PACKED + EQUIP READY TO SHIP.