



December 9, 2011

Mr. Charles Gruenenfelder  
Washington State Department of Ecology  
Eastern Regional Office  
N. 4601 Monroe  
Spokane, Washington 99205

RE: Final Report  
2011 Annual Performance Monitoring  
Black Sand Beach Project  
Stevens County, Washington  
**URS Job No. 36310105**

Dear Mr. Gruenenfelder:

This letter report provides a summary of the October 3, 2011 Annual Performance Monitoring Event conducted at Black Sand Beach in Stevens County, Washington. This is the first Performance Monitoring Report following completion of the Black Sand Beach project in October 2010.

## **BACKGROUND**

Construction of the Black Sand Beach project was performed from September 2010 through October 2010. The Black Sand Beach is a locally recognized beach along the southeastern bank of the Columbia River just downstream from United States Geological Survey (USGS) Columbia River Auxiliary Gage Station (also referred to as USGS gauging station or gauging station) at approximately river mile 743. The project consisted of removing approximately 9,100 tons (about 6,500 cubic yards) of sediment containing granulated slag from a prescribed area commonly referred to as Black Sand Beach; loading and transporting these sediments to the Trimac facility located at 9595 Highway 22A, Trail, British Columbia for subsequent recycling at the Teck Metals, Ltd. Facility in Trail, British Columbia; replacing the beach with clean fill materials; and returning temporary road improvements to their original primitive conditions.

The project was conducted by Teck American Incorporated (TAI) pursuant to an Interim Action Voluntary Cleanup Agreement (VCP Agreement) between TAI and the Washington State Department of Ecology (Ecology) dated July 13, 2009. The VCP Agreement is consistent with the Model Toxics Control Act (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC), and with Revised Code of Washington (RCW) 70.105D.

The project was performed in accordance with the Ecology-approved "*Final Work Plan for Black Sand Beach, Stevens County, Washington*" dated August 2010 and associated documents. Completion of the project was documented in a report prepared by URS Corporation (URS) and submitted to Ecology



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entitled “*Black Sand Beach Project Completion Report & Performance Monitoring Plan, Black Sand Beach, Stevens County, Washington*” dated March 2011 (Completion Report).

As described in the VCP Agreement and consistent with the approved Performance Monitoring Plan provided in the Completion Report, TAI will perform annual monitoring for a three year period (through 2013) for a maximum of five years following completion of the Black Sand Beach project (through 2015). Following the three year period, Ecology will evaluate findings from the annual monitoring program and discuss with TAI possible modifications to the monitoring program including, but not limited to, a possible reduction in the duration of annual performance monitoring. The purpose of the annual performance monitoring is to record changes in site conditions, including sediment erosion and/or re-deposition that may occur in the project site area.

#### **FIELD MONITORING SUMMARY**

The 2011 performance monitoring event was performed by URS (David Enos and Paul McCullough) on October 3, 2011 in accordance with the approved Performance Monitoring Plan. The monitoring event consisted of performing a topographic survey (Daniel Sampson of Survey Solutions) within the area where sediments were removed and replaced, documenting visual observations, and obtaining photographs at pre-selected stations identified in the Completion Report.

During the performance monitoring event on-site stakeholders included:

- The Washington State Department of Ecology (Charles Gruenenfelder, Mike Hibbler, John Roland, Jeremy Schmidt);
- The Washington State Department of Natural Resources (Arne Johnson);
- The Citizens for a Clean Columbia (Mindy Smith, Clifford Ward, Joe Wichmann);
- Local Residents (Diane Hall and Matt Wolohan); and
- TAI (Marko Adzic).

Surveyed elevation of the upper Columbia River near the site at the time of the October 3, 2011 monitoring event was 1299.1 feet above mean sea level based on the North American Vertical Datum of 1988 (NAVD88). This was approximately the same as the measured river elevation at the time of the “As-Built” topographic survey performed on November 1, 2010 (1299.3 feet, NAVD88).

## RESULTS

Results of the 2011 Annual Performance Monitoring event are included in following attachments.

- **Table 1 – Surface Elevation Measurement and Visual Observation Monitoring Results.** Table 1 compares surface elevations at established surface elevation monitoring locations at the time of the As-Built survey on November 1, 2010 and the Annual Performance Monitoring Survey (October 3, 2011). Visual observations are also recorded.
- **Figure 1 - 2010 Topographic Survey Map:** Figure 1 illustrates 1-foot (ft) topographic elevation contours at time of As-Built Survey following completion of the Black Sand Beach project. The topographic survey was performed by a licensed land surveyor (Survey Solutions) on November 1, 2010.
- **Figure 2 - 2011 Topographic Survey Map:** Figure 2 illustrates 1-ft topographic elevation contours at the time of the 2011 Annual Performance Monitoring (October 3, 2011). This topographic survey was again performed by Survey Solutions.
- **Figure 3 – ISOpach 2010 Survey vs 2011 Survey:** Figure 3 illustrates 0.5-ft contours depicting the difference in surface elevations between the 2010 and 2011. These contours illustrate areas where erosion and deposition have occurred. The calculated volume difference between the November 1, 2010 and October 3, 2011 topographical features is a net decrease (loss) of 401 cubic yards, as calculated using Autodesk Civil 3D<sup>®</sup> 2011 and survey measurement data from Survey Solutions, Spokane, Washington.
- **Figure 4 – Performance Monitoring Locations:** Figure 4 depicts locations of pre-selected photographic stations and surface elevation monitoring point stations. These stations were identified in the Completion Report for subsequent monitoring and are intended to provide a consistent set of locations to document changes in beach conditions over time.
- **Figure 5 – 2010 As-Built Photographs:** Figure 5 presents a map showing positions and approximate directions that photographs were taken, as well as the corresponding photograph. Photographs depicted on this figure were taken in October 2010 and are consistent with those presented in Appendix E of the As-Built.
- **Figure 6 – Performance Monitoring Locations and 2011 Photographs:** Figure 6 provides photographs taken during the October 3, 2011 Annual Performance Monitoring event. Surface elevations shown on this figure are based on the October 3, 2011 topographic survey.
- **Appendix A – Photographic Log:** Appendix A presents side-by-side photographs of the site at each of the designated photographic stations (PP-1 through PP-11). Each photo station is on a single page. The uppermost photograph was taken at or near completion of the project (i.e., As-Built Photograph) and the lowermost photograph was taken during the 2011 Annual Performance Monitoring event.
- **Appendix B – Supplemental Photographic Log:** Appendix B presents additional photographs taken during the 2011 Annual Performance Monitoring Event, including photographs taken at



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different angles at each photo station location, as well as other photos taken during the 2011 Annual Performance Monitoring event.

- **Appendix C – Large Photograph Maps:** Appendix D provides Figures 5 and 6 on larger “D-size” paper.

## PROFESSIONAL ENGINEER’S STATEMENT

URS was retained by TAI to perform the Black Sand Beach Project and to conduct the 2011 Performance Monitoring event at Black Sand Beach in Stevens County, Washington. In that role, URS, represented by the undersigned, maintained active involvement in the planning and implementation of the various project activities, including performance monitoring.

This report is intended for the sole use of TAI. The scope of services performed by URS in preparing this report may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or of its findings presented herein is at the sole risk of said user. The services performed by URS have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in Washington. The findings presented in this report are based on conditions observed at specific site locations at the time of the observation. Conditions may change over distance and time. No other warranty is expressed or implied.

As the designated URS representative, I hereby conclude that, to the best of my knowledge, the work summarized in this report has been satisfactorily completed in substantial compliance with the Completion Report and other related documents.

Sincerely,

A handwritten signature in blue ink that reads "Paul T. McCullough".

Paul T. McCullough, P.E.  
Senior Project Engineer  
Washington P.E. Certificate/License No. 43590

Attachments



Mr. Charles Gruenenfelder  
Washington State Department of Ecology  
December 9, 2011`  
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cc: Marko Adzic, TAI (one copy + electronic DVD)  
Karin Diven, DFW (electronic DVD)  
Dave Enos, URS (one copy + electronic DVD)  
Tim Erkel, USACE (one copy + electronic DVD)  
Arne Johnson, DNR (one copy + electronic DVD)  
Joseph Wichmann, CCC (one copy + electronic DVD)  
Matt Wolohan, Adjacent Land Owner (one copy + electronic DVD)

## **TABLES**

Table 1  
Surface Elevation Measurement and Visual Observation Monitoring Results  
Black Sand Beach, Northport, Washington

Location Id	Washington State Plane, North Zone, NAD 83 US FT		WGS 84		Surface Elevation <sup>1,2</sup> NAVD 88, US FT.			Visual Observations <sup>4</sup>
	Northing	Easting	Lat	Long	1-Nov-10	3-Oct-11	Change (ft) <sup>3</sup>	
E-1	734841.076	2405298.862	48.97101	-117.64829	1299.292	--	--	Location was submerged and not accessible for survey
E-2	734784.592	2405242.019	48.97086	-117.64853	1299.387	1298.651	0.736	Rounded gravel
E-3	734743.033	2405180.007	48.97075	-117.64880	1299.277	1299.242	0.035	Less than approximately 10% black silica glass <sup>5</sup> in a sand matrix
E-4	734717.573	2405196.222	48.97068	-117.64874	1304.799	1304.058	0.741	Less than approximately 10% black silica glass in a sand matrix
E-5	734764.950	2405256.421	48.97080	-117.64848	1304.330	1305.741	-1.411	Less than approximately 10% black silica glass, approximately 20% rounded gravel
E-6	734815.170	2405321.316	48.97093	-117.64820	1304.479	1305.191	-0.712	Less than approximately 10% black silica glass, approximately 50% rounded gravel
E-7	734692.594	2405214.770	48.97061	-117.64866	1306.710	1305.344	1.366	Rounded gravel
E-8	734738.178	2405277.467	48.97073	-117.64840	1305.798	1305.652	0.146	Less than approximately 2% black silica glass, approximately 40% rounded gravel
E-9	734781.507	2405341.661	48.97084	-117.64812	1305.629	1305.797	-0.168	Less than approximately 5% black silica glass and 20% rounded gravel
E-10	734700.576	2405276.494	48.97062	-117.64841	1306.680	1306.304	0.376	Less than 2% black silica glass, approximately 60% rounded gravel and cobbles
E-11	734747.683	2405345.491	48.97074	-117.64811	1306.423	1306.403	0.020	Less than approximately 5% black silica glass and 10% rounded gravel
E-12	734668.683	2405296.797	48.97053	-117.64833	1310.981	1310.943	0.038	Mostly sand with about 2% black silica glass and approximately 20% gravel
E-13	734846.991	2405410.101	48.97101	-117.64782	1299.348	1299.334	0.014	Less than approximately 10% black silica glass in a fine sand matrix
E-14	734853.020	2405459.923	48.97102	-117.64762	1299.279	1298.468	0.811	Rounded gravel
E-15	734854.195	2405513.926	48.97102	-117.64739	1299.371	1299.322	0.049	Less than approximately 10% black silica glass in a sand matrix
E-16	734809.862	2405394.109	48.97091	-117.64790	1305.094	1303.324	1.770	Rounded gravel
E-17	734808.467	2405442.281	48.97090	-117.64770	1305.482	1306.680	-1.198	Less than approximately 1% black silica glass, sand, and about 10% gravel
E-18	734809.245	2405492.399	48.9709	-117.64749	1305.713	1305.723	-0.010	Less than approximately 1% black silica glass, sand, and about 10% gravel
E-19	734769.189	2405375.738	48.9708	-117.64798	1307.333	1305.854	1.479	Less than approximately 10% black silica glass, sand, and about 25% gravel
E-20	734774.538	2405448.834	48.97081	-117.64768	1308.452	1308.527	-0.075	Less than approximately 20% black silica glass in a sand matrix
E-21	734729.067	2405385.597	48.97069	-117.64795	1309.659	1309.477	0.182	Approximately 2% black silica glass, sand, and 30% gravel

Notes

<sup>1</sup> Locations of Surface Elevation Monitoring Points are noted in Figure 8, Performance Monitoring Locations of report titled: "Completion Report & Performance Monitoring Plan" dated March 2011.

<sup>2</sup> Both the topographic surveys on 11/1/10 and 10/3/11 were performed by Survey Solutions using Trimble R-8 GPS Receivers with a TSC2 Controller and realtime kinematic survey procedures.

<sup>3</sup> A positive change in surface elevation corresponds to a lower elevation in 2011 compared to 2010. A negative change in elevation corresponds to a higher elevation in 2011 compared to 2010.

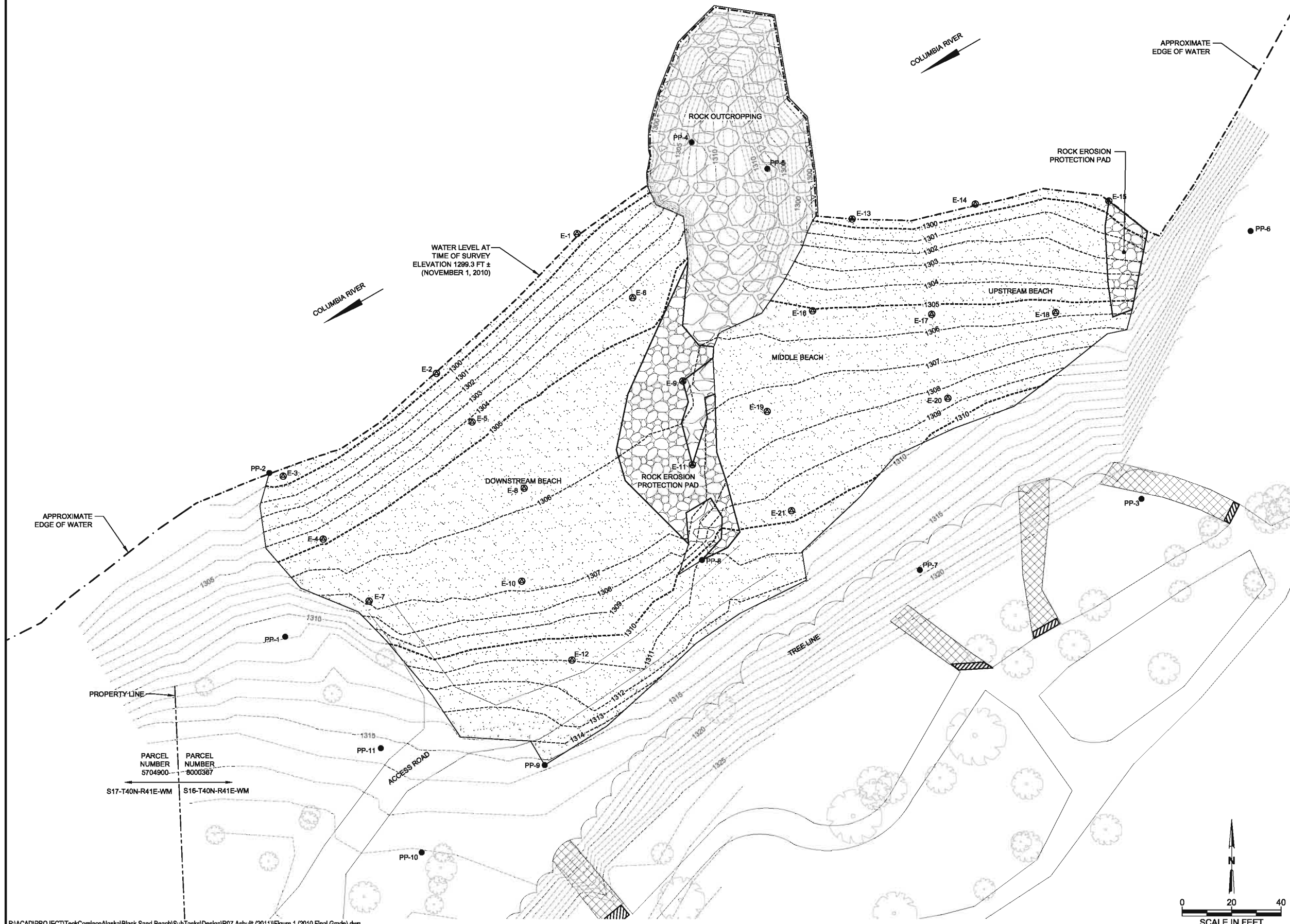
<sup>4</sup> Visual observations of beach materials was conducted at each accessible Surface Elevation Monitoring Point on October 3, 2011 by a licensed geologist.

<sup>5</sup> Vitreous, conchoidal fractures, translucent appearance (consistent with the appearance of granulated slag).

## **FIGURES**



NO.	DATE	BY	REVISION DESCRIPTION
0	10/28/11	PTM	2011 PERFORMANCE MONITORING REPORT



**EQUIPMENT AND PROCEDURES**  
 THIS SURVEY WAS PERFORMED BY SURVEY SOLUTIONS, SPOKANE, WASHINGTON WITH TRIMBLE R-8 GPS RECEIVERS WITH A TSC2 CONTROLLER USING REAL TIME KINEMATIC SURVEY PROCEDURES.

**SURVEYOR'S NOTES**

1. THE PURPOSE OF THIS SURVEY WAS TO CONDUCT A TOPOGRAPHIC SURVEY.
2. HORIZONTAL DATUM, WASHINGTON STATE PLANE, NORTH ZONE. VERTICAL DATUM, NAVD 88. BASED ON WSDOT STATION "YONDER", LOCATED 0.25 MILES SOUTH OF WANETA BORDER CROSSING AND 52' WEST OF THE CENTERLINE OF THE WANETA CUSTOMS ROAD, THREE INCH BRASS CAP IN CEMENT, 745,055.705' N, 2,409,429.512' E, ELEV. 1,457.071'.
3. THIS MAP SHOWS ELEVATION DATA COLLECTED ON 11/01/2010, WITHIN THE NEW SAND LIMIT BOUNDARY AND ELEVATION DATA FROM 12/20/2006 MAPPING OUTSIDE SAID NEW SAND LIMIT.
4. THE WATER LEVEL STAFF GAUGE, 304' NORTHEAST OF SURVEY CONTROL #1 WAS 1296.56' AT 11:26 AM 11/01/2010 (NOTE: EQUALS 1298.46' USING THIS SURVEY DATUM).
5. SOURCE: SURVEY SOLUTIONS, SPOKANE, WASHINGTON.

**GENERAL NOTE:**  
 SEE TABLE 1 FOR SURFACE MONITORING POINT ELEVATION DATA.

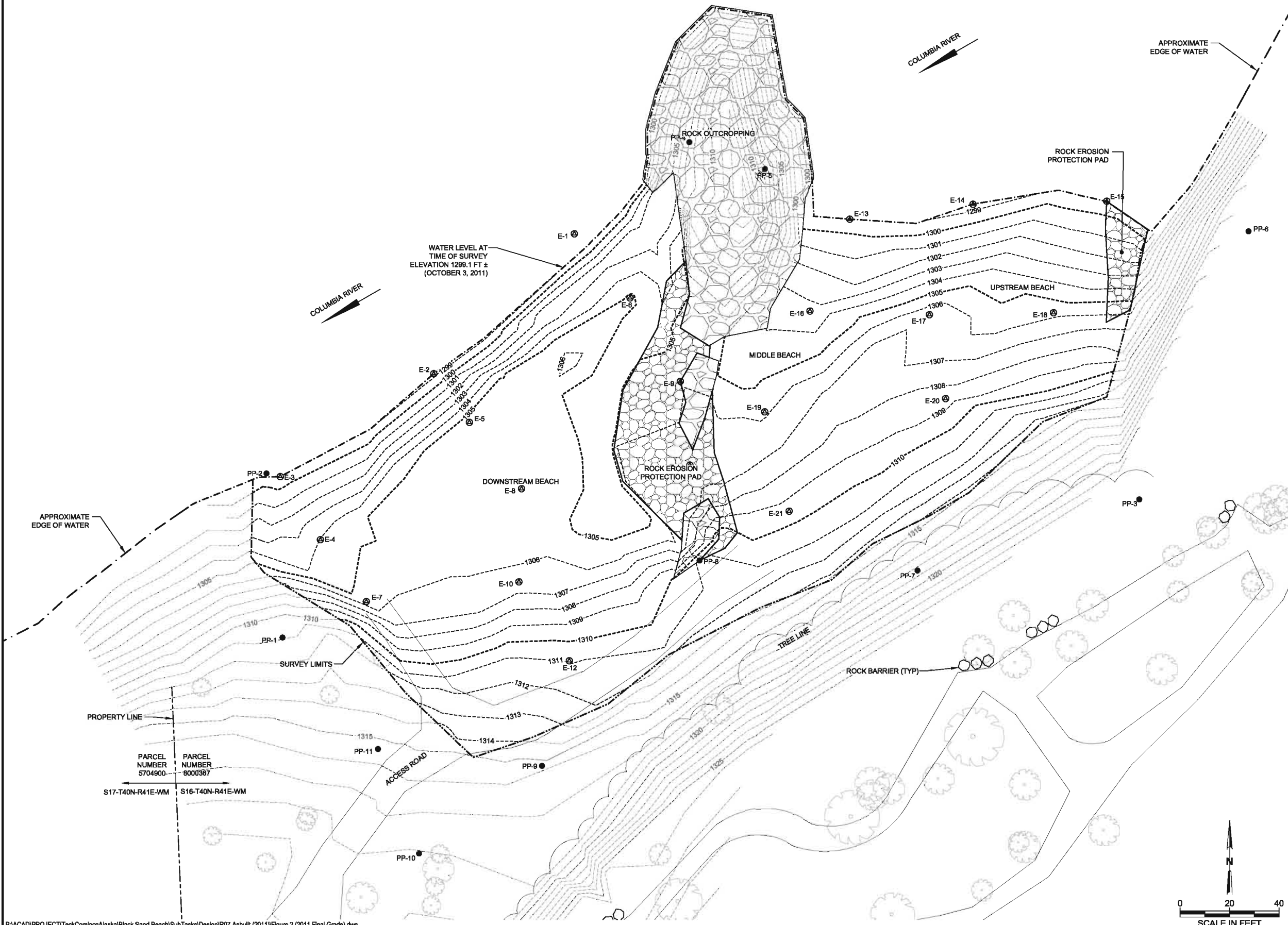
- LEGEND**
- PROPERTY LINE
  - - - - - EDGE OF WATER
  - PP-8 PHOTO STATION
  - ⊙ E-21 SURFACE ELEVATION MONITORING LOCATION
  - ▨ PORTION OF UNUSED ACCESS ROAD LEADING TO BLACK SAND BEACH
  - ▩ MATERIAL PLACED TO BLOCK ROAD ACCESS PER WDNR (LARGE ROCKS AND ROOT BALLS)
  - ▤ LIMITS OF REPLACED BEACH SAND
  - ⊞ ROCK EROSION PROTECTION PAD WITH SMALL COBBLE TOPPING
  - ⊞ EXPOSED ROCK OUTCROPPING

BLACK SAND BEACH PROJECT  
 STEVENS COUNTY, WASHINGTON

**FIGURE 1  
 2010 TOPOGRAPHIC  
 SURVEY MAP**

DESIGNED BY: PTM/HDL	 1601 4TH AVENUE, SUITE 1400 SEATTLE, WA 98101-1616 (206) 438-2700	SHEET
DRAWN BY: CFS		DRAWING NO.
CHECKED BY: RDE		
APPROVED BY: PTM		
REVISION: REV 1		
DATE: NOV 2011		

NO.	DATE	BY	REVISION DESCRIPTION
0	10/28/11	PTM	2011 PERFORMANCE MONITORING REPORT



**EQUIPMENT AND PROCEDURES**  
 THIS SURVEY WAS PERFORMED BY SURVEY SOLUTIONS, SPOKANE, WASHINGTON WITH TRIMBLE R-8 GPS RECEIVERS WITH A TSC2 CONTROLLER USING REAL TIME KINEMATIC SURVEY PROCEDURES.

- SURVEYOR'S NOTES**
1. THE PURPOSE OF THIS SURVEY WAS TO CONDUCT A TOPOGRAPHIC SURVEY.
  2. HORIZONTAL DATUM, WASHINGTON STATE PLANE, NORTH ZONE. VERTICAL DATUM, NAVD 88. BASED ON WSDOT STATION "YONDER", LOCATED 0.25 MILES SOUTH OF WANETA BORDER CROSSING AND 52' WEST OF THE CENTERLINE OF THE WANETA CUSTOMS ROAD, THREE INCH BRASS CAP IN CEMENT, 745,055.705' N, 2,409,429.512' E, ELEV. 1,457.071'.
  3. THIS MAP SHOWS NEW ELEVATION DATA COLLECTED ON 10/03/2011, GENERALLY WITHIN THE LIMITS OF THE REPLACEMENT SAND AS DESIGNATED ON THE 2010 AS-BUILT TOPOGRAPHIC SURVEY CONDUCTED ON 11/01/2010.
  4. THE WATER LEVEL STAFF GAUGE, 304' NORTHEAST OF SURVEY CONTROL #1 WAS 1299.43' AT 10:45 AM 10/03/2011 (NOTE: EQUALS 1299.33' USING THIS SURVEY DATUM).
  5. SOURCE: SURVEY SOLUTIONS, SPOKANE, WASHINGTON.

**GENERAL NOTE:**  
 SEE TABLE 1 FOR SURFACE MONITORING POINT ELEVATION DATA.

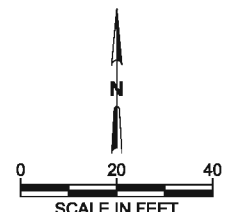
**LEGEND**


	PROPERTY LINE
	EDGE OF WATER
	2011 SURVEY LIMITS
	PP-8 ● PHOTO STATION
	E-21 ⊕ SURFACE ELEVATION MONITORING LOCATION
	ROCK EROSION PROTECTION PAD WITH SMALL COBBLE TOPPING
	EXPOSED ROCK OUTCROPPING

BLACK SAND BEACH PROJECT  
 STEVENS COUNTY, WASHINGTON










**FIGURE 2  
 2011 TOPOGRAPHIC  
 SURVEY MAP**

DESIGNED BY: PTM/HDL	 1501 4TH AVENUE, SUITE 1400 SEATTLE, WA 98101-1616 (206) 439-2700	SHEET
DRAWN BY: CFS		DRAWING NO.
CHECKED BY: RDE		
APPROVED BY: PTM		
REVISION: REV 1		
DATE: NOV 2011		

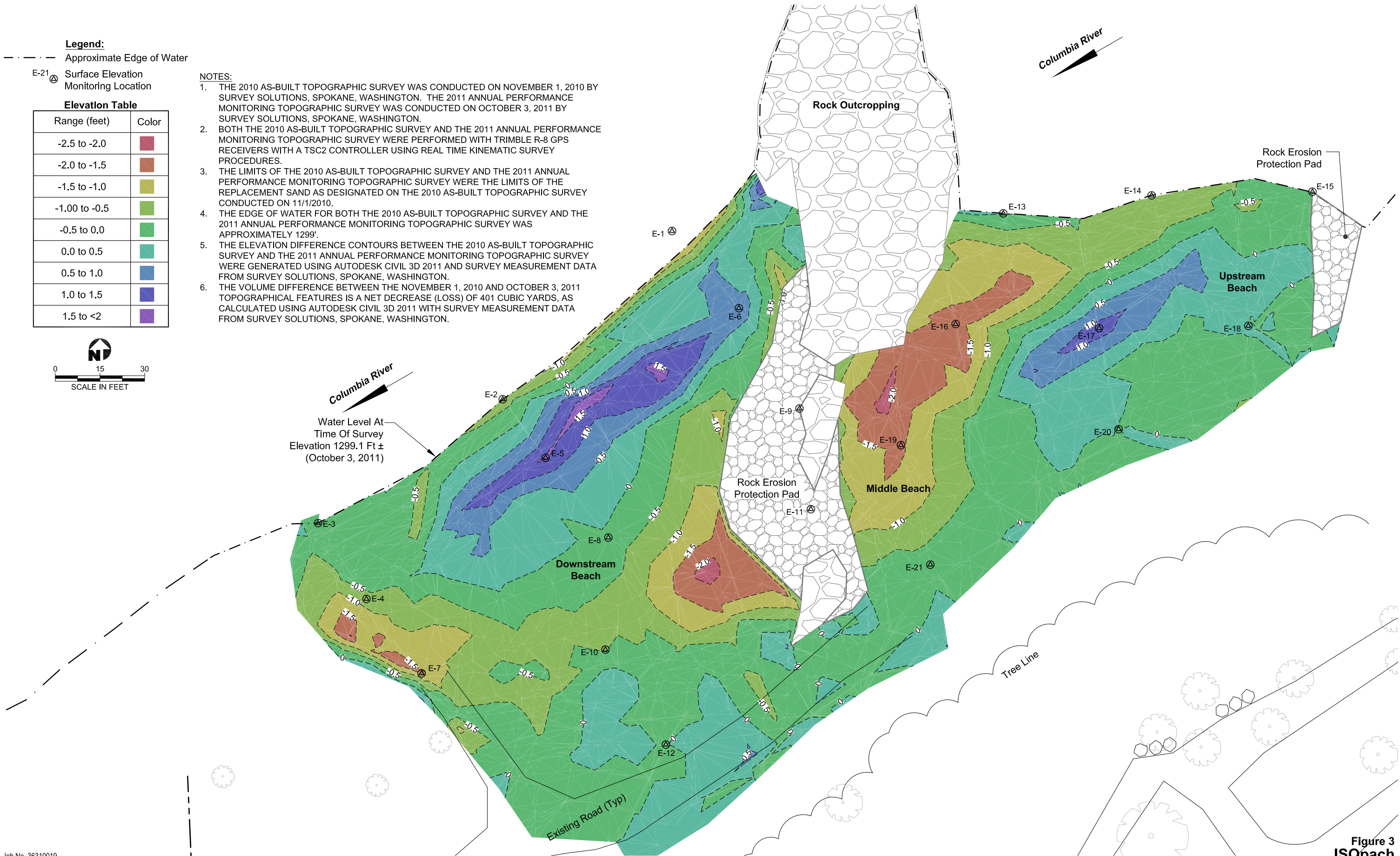
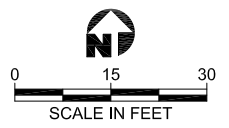


- Legend:**
- - - - - Approximate Edge of Water
  - E-21  Surface Elevation Monitoring Location

**Elevation Table**

Range (feet)	Color
-2.5 to -2.0	
-2.0 to -1.5	
-1.5 to -1.0	
-1.00 to -0.5	
-0.5 to 0.0	
0.0 to 0.5	
0.5 to 1.0	
1.0 to 1.5	
1.5 to <2	

- NOTES:**
1. THE 2010 AS-BUILT TOPOGRAPHIC SURVEY WAS CONDUCTED ON NOVEMBER 1, 2010 BY SURVEY SOLUTIONS, SPOKANE, WASHINGTON. THE 2011 ANNUAL PERFORMANCE MONITORING TOPOGRAPHIC SURVEY WAS CONDUCTED ON OCTOBER 3, 2011 BY SURVEY SOLUTIONS, SPOKANE, WASHINGTON.
  2. BOTH THE 2010 AS-BUILT TOPOGRAPHIC SURVEY AND THE 2011 ANNUAL PERFORMANCE MONITORING TOPOGRAPHIC SURVEY WERE PERFORMED WITH TRIMBLE R-8 GPS RECEIVERS WITH A TSC2 CONTROLLER USING REAL TIME KINEMATIC SURVEY PROCEDURES.
  3. THE LIMITS OF THE 2010 AS-BUILT TOPOGRAPHIC SURVEY AND THE 2011 ANNUAL PERFORMANCE MONITORING TOPOGRAPHIC SURVEY WERE THE LIMITS OF THE REPLACEMENT SAND AS DESIGNATED ON THE 2010 AS-BUILT TOPOGRAPHIC SURVEY CONDUCTED ON 11/1/2010.
  4. THE EDGE OF WATER FOR BOTH THE 2010 AS-BUILT TOPOGRAPHIC SURVEY AND THE 2011 ANNUAL PERFORMANCE MONITORING TOPOGRAPHIC SURVEY WAS APPROXIMATELY 1299'.
  5. THE ELEVATION DIFFERENCE CONTOURS BETWEEN THE 2010 AS-BUILT TOPOGRAPHIC SURVEY AND THE 2011 ANNUAL PERFORMANCE MONITORING TOPOGRAPHIC SURVEY WERE GENERATED USING AUTODESK CIVIL 3D 2011 AND SURVEY MEASUREMENT DATA FROM SURVEY SOLUTIONS, SPOKANE, WASHINGTON.
  6. THE VOLUME DIFFERENCE BETWEEN THE NOVEMBER 1, 2010 AND OCTOBER 3, 2011 TOPOGRAPHICAL FEATURES IS A NET DECREASE (LOSS) OF 401 CUBIC YARDS, AS CALCULATED USING AUTODESK CIVIL 3D 2011 WITH SURVEY MEASUREMENT DATA FROM SURVEY SOLUTIONS, SPOKANE, WASHINGTON.



Water Level At Time Of Survey  
Elevation 1299.1 Ft ±  
(October 3, 2011)

Job No. 36310019  
P:\ACAD\PROJECT\Tecomino\Alaska\Black Sand Beach\SubTasks\Design\R07 Asbuilt (2011)\Figure 3 (ISOpach - 2010 vs 2011).dwg  
Mod: 11/15/2011, 08:25 | Plotted: 12/06/2011, 16:06 | Chad\_Stickel



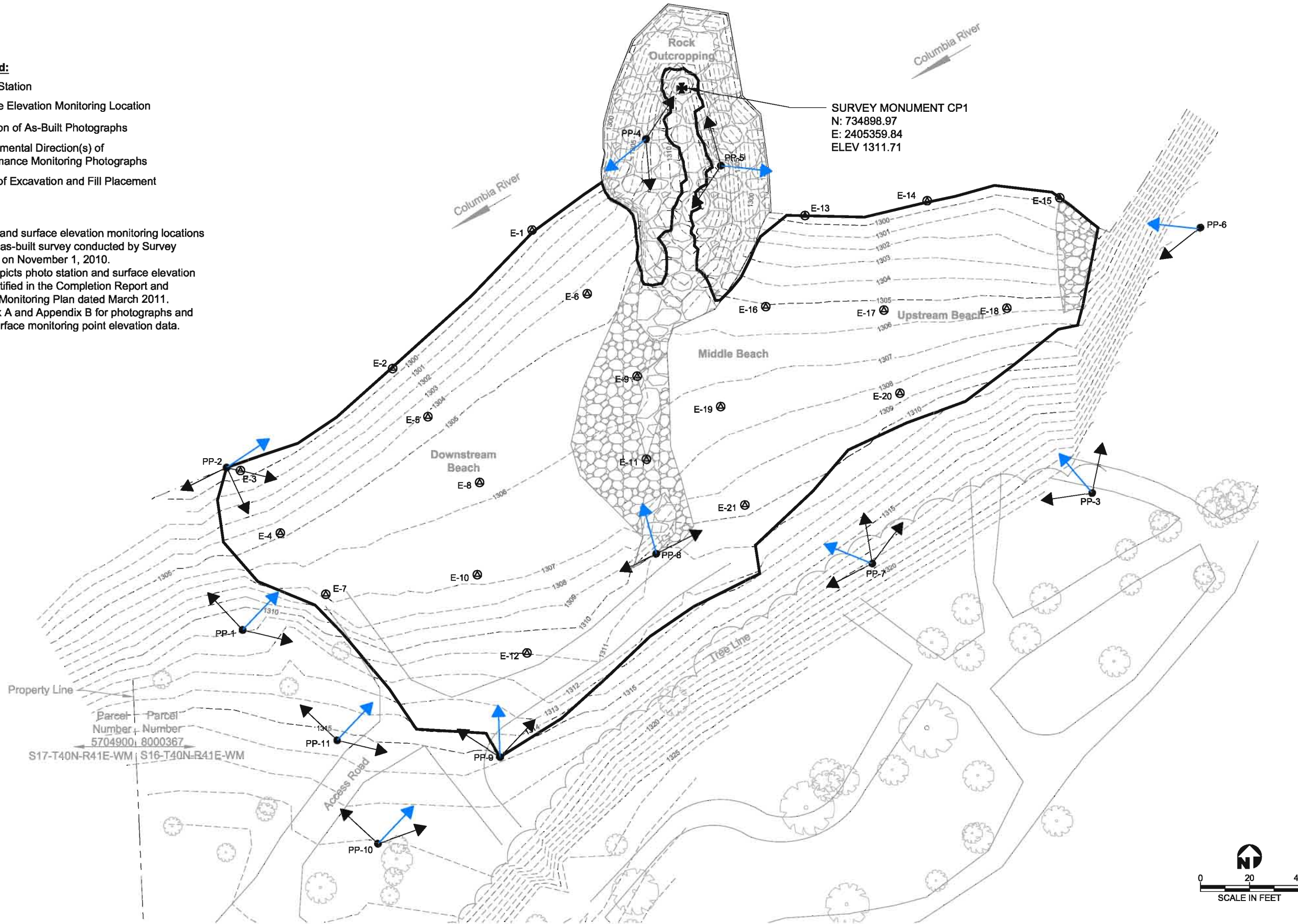
**Figure 3**  
**ISOpach**  
**2010 Asbuilt Survey vs 2011 Survey**

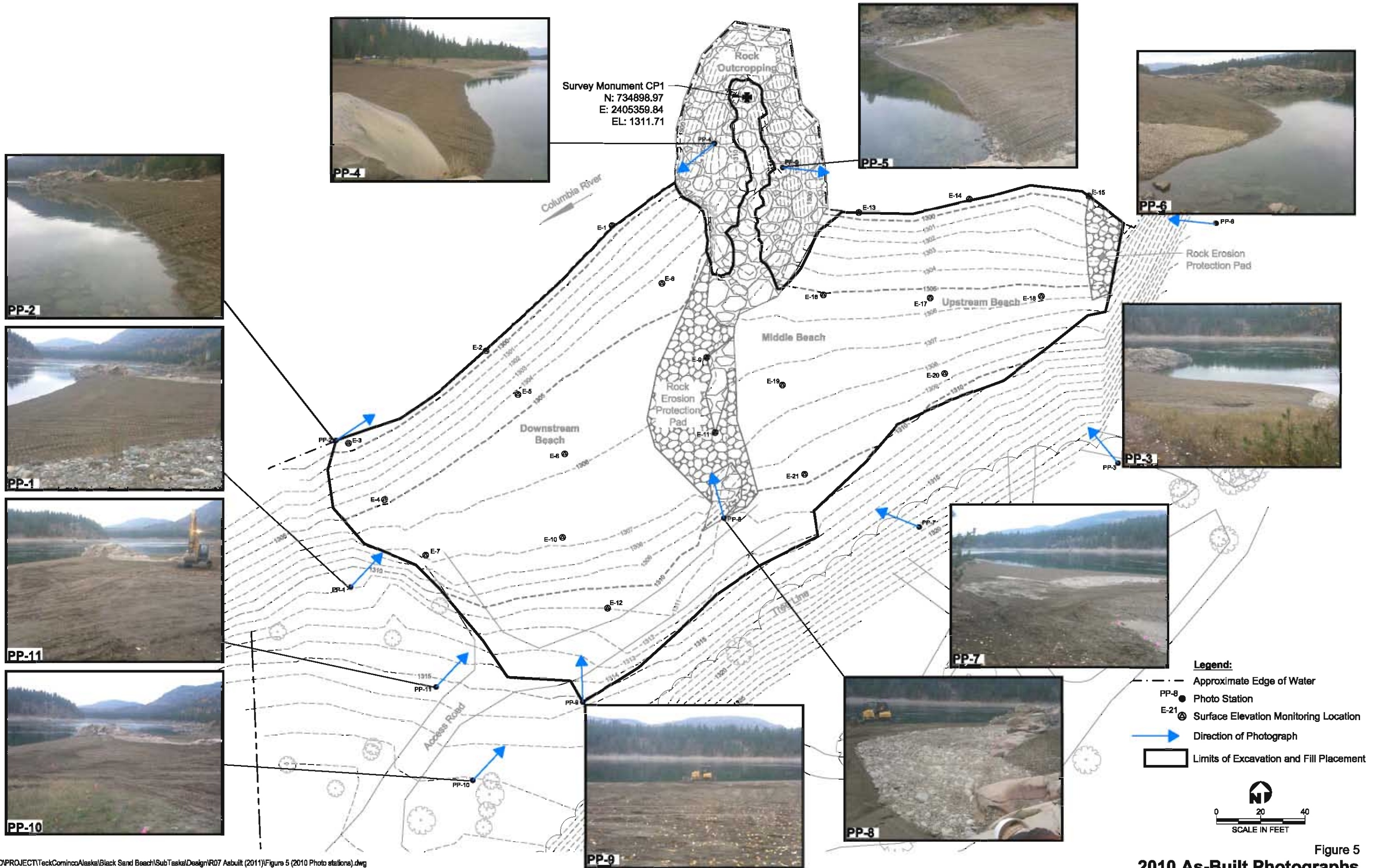
Black Sand Beach  
Northport, Washington

- Legend:**
- PP-8 ● Photo Station
  - E-21 ⊕ Surface Elevation Monitoring Location
  - ➡ Direction of As-Built Photographs
  - ➡ Supplemental Direction(s) of Performance Monitoring Photographs
  - ▭ Limits of Excavation and Fill Placement

**Notes:**

1. Photo station and surface elevation monitoring locations are based on as-built survey conducted by Survey Solutions Inc. on November 1, 2010.
2. This figure depicts photo station and surface elevation locations identified in the Completion Report and Performance Monitoring Plan dated March 2011.
3. See Appendix A and Appendix B for photographs and Table 1 for surface monitoring point elevation data.

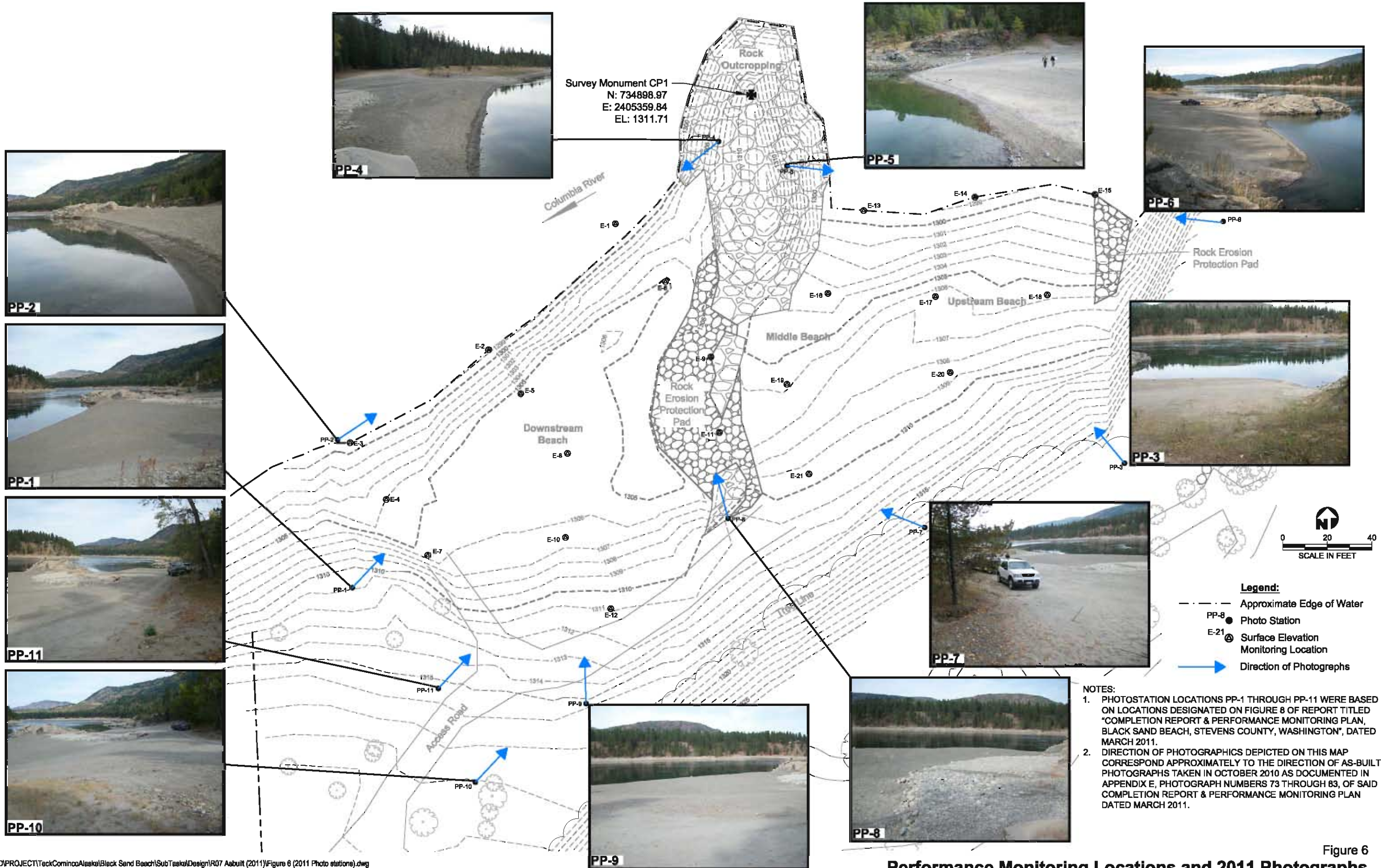




P:\ACAD\PROJECT\TackCominco\Alaska\Black Sand Beach\SubTask\Design\R07 Asbuilt (2011)\Figure 5 (2010 Photo stations).dwg  
 Mod: 11/04/2011, 14:29 | Plotted: 11/15/2011, 08:00 | Chad\_Stickel



Figure 5  
**2010 As-Built Photographs**  
 Black Sand Beach  
 Northport, Washington



P:\ACAD\PROJECT\TackComincoAleaka\Black Sand Beach\SubTask\Design\R07 Aebuilt (2011)\Figure 6 (2011 Photo stations).dwg  
 Mod: 11/15/2011, 08:03 | Plotted: 11/15/2011, 08:04 | Chad\_Stickel



Figure 6  
**Performance Monitoring Locations and 2011 Photographs**  
 Black Sand Beach  
 Northport, Washington

**APPENDIX A**  
**PHOTOGRAPHIC LOG**



# APPENDIX A: PHOTOGRAPHIC LOG

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**1**

**Photo Taken:**  
**10/28/10**

**Direction Taken:**  
**Northeast**

**Description:**

Photo Station No. 1  
(Completion Report and  
Performance  
Monitoring Plan, March  
2010)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734678.06  
E. 2405180.90



**Photo No.**  
**2**

**Photo Taken:**  
**10/03/11**

**Direction Taken:**  
**Northeast**

**Description:**

Photo Station No. 1  
(2011 Annual  
Performance  
Monitoring Report ,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734678.06  
E. 2405180.90







# APPENDIX A: PHOTOGRAPHIC LOG

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**3**

**Photo Taken:**  
**10/28/10**

**Direction Taken:**  
**Northeast**

**Description:**

Photo Station No. 2  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734744.33  
E. 2405174.42



**Photo No.**  
**4**

**Photo Taken:**  
**10/03/11**

**Direction Taken:**  
**Northeast**

**Description:**

Photo Station No. 2  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734744.33  
E. 2405174.42





**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**5**

**Photo Taken:**  
**10/28/10**

**Direction Taken:**  
**Northwest**

**Description:**

Photo Station No. 3  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734733.88  
E. 2405527.09



**Photo No.**  
**6**

**Photo Taken:**  
**10/03/11**

**Direction Taken:**  
**Northwest**

**Description:**

Photo Station No. 3  
(2011 Annual  
Performance  
Monitoring Report ,  
December 2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734733.88  
E. 2405527.09





# APPENDIX A: PHOTOGRAPHIC LOG

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

URS Project No.:  
36310105

Photo No.  
**7**

Photo Taken:  
10/28/10

Direction Taken:  
Southwest

**Description:**

Photo Station No. 4  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734878.14  
E. 2405345.23



Photo No.  
**8**

Photo Taken:  
10/03/11

Direction Taken:  
Southwest

**Description:**

Photo Station No. 4  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734878.14  
E. 2405345.23





# APPENDIX A: PHOTOGRAPHIC LOG

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

URS Project No.:  
36310105

Photo No.  
**9**

Photo Taken:  
10/28/10

Direction Taken:  
Northeast

**Description:**

Photo Station No. 5  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734867.28  
E. 2405375.81



Photo No.  
**10**

Photo Taken:  
10/03/11

Direction Taken:  
Northeast

Photo Station No. 5  
(2011 Annual  
Performance  
Monitoring Report ,  
December 2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734867.28  
E. 2405375.81





# APPENDIX A: PHOTOGRAPHIC LOG

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**11**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
West

**Description:**

Photo Station No. 6  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734842.12  
E. 2405571.21



**Photo No.**  
**12**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

Photo Station No. 6  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734842.12  
E. 2405571.21





**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**13**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
Northwest

**Description:**  
Photo Station No. 7  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734705.11  
E. 2405437.47



**Photo No.**  
**14**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**  
Photo Station No. 7  
(2011 Annual  
Performance  
Monitoring Report ,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734705.11  
E. 2405437.47





**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**15**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
Northwest

**Description:**  
Photo Station No. 8  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734709.15  
E. 2405349.41



**Photo No.**  
**16**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**  
Photo Station No. 8  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone,  
NAD 83, US Ft

N. 734709.15  
E. 2405349.41





**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**17**

**Direction Photo**  
**Taken: 10/28/10**  
  
**North**

**Description:**

Photo Station No. 9  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734626.25  
E. 2405285.80



**Photo No.**  
**18**

**Direction Photo**  
**Taken: 10/03/11**  
  
**North**

**Description:**

Photo Station No. 9  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734626.25  
E. 2405285.80







**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**19**

**Direction Photo  
Taken: 10/28/10**  
  
**Northeast**

**Description:**

Photo Station No. 10  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734590.89  
E. 2405236.06



**Photo No.**  
**20**

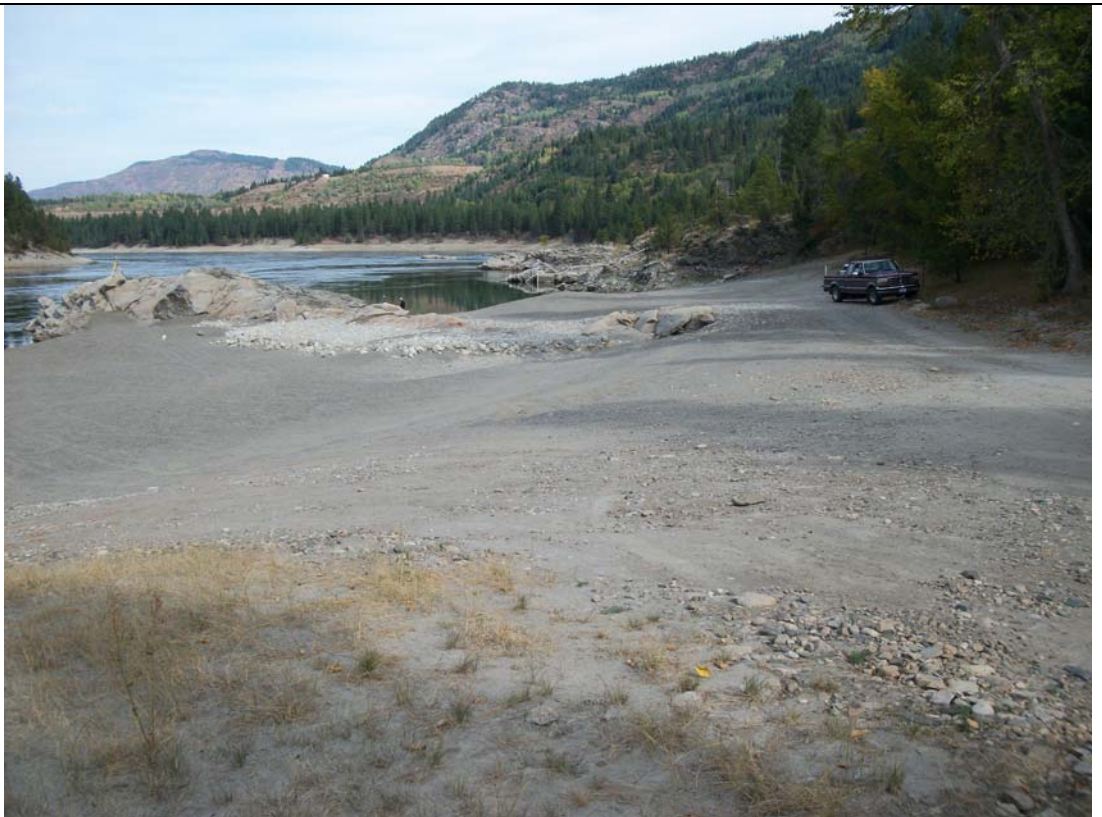
**Direction Photo  
Taken: 10/03/11**  
  
**Northeast**

**Description:**

Photo Station No. 10  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734590.89  
E. 2405236.06





**APPENDIX A:  
PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**21**

**Direction Photo  
Taken: 10/28/10**

**Northeast**

**Description:**

Photo Station No. 11  
(Completion Report and  
Performance  
Monitoring Plan, March  
2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734633.06  
E. 2405219.44



**Photo No.**  
**22**

**Direction Photo  
Taken: 10/03/11**

**Northeast**

**Description:**

Photo Station No. 11  
(2011 Annual  
Performance  
Monitoring Report,  
December 2011)

Washington State  
Plane, North Zone  
NAD 83, US Ft

N. 734633.06  
E. 2405219.44



**APPENDIX B**  
**SUPPLEMENTAL PHOTOGRAPHIC LOG**

Appendix B  
 Supplemental Photographic Log – Black Sand Beach, Northport, WA  
 2011 Annual Performance Monitoring Event  
 October 3, 2011

Photograph Name	Photograph Station Number or Description	Direction of Photograph	Date	Time
B-01	1	Northwest	October 3, 2011	13:19
B-02	1	North	October 3, 2011	13:20
B-03	1	Northeast	October 3, 2011	13:20
B-04	1	East	October 3, 2011	13:20
B-05	2	Southwest	October 3, 2011	13:21
B-06	2	Northeast	October 3, 2011	13:21
B-07	2	East	October 3, 2011	13:21
B-08	2	East	October 3, 2011	13:22
B-09	2	Southeast	October 3, 2011	13:22
B-10	2	South	October 3, 2011	13:22
B-11	3	West	October 3, 2011	13:40
B-12	3	Northwest	October 3, 2011	13:40
B-13	3	North	October 3, 2011	13:40
B-14	4	Northeast	October 3, 2011	13:30
B-15	4	Southwest	October 3, 2011	13:31
B-16	4	South	October 3, 2011	13:31
B-17	4	South	October 3, 2011	13:31
B-18	5	North	October 3, 2011	13:29
B-19	5	East	October 3, 2011	13:30
B-20	5	Southwest	October 3, 2011	13:30
B-21	6	Southwest	October 3, 2011	11:23
B-22	6	West	October 3, 2011	11:23
B-23	7	Northeast	October 3, 2011	13:38
B-24	7	North	October 3, 2011	13:38
B-25	7	Northwest	October 3, 2011	13:38
B-26	7	West	October 3, 2011	13:39
B-27	8	West	October 3, 2011	13:25
B-28	8	Northwest	October 3, 2011	13:25
B-29	8	North	October 3, 2011	13:26
B-30	8	Northeast	October 3, 2011	13:26
B-31	8	Northeast	October 3, 2011	13:26
B-32	8	East	October 3, 2011	13:26
B-33	9	Northwest	October 3, 2011	13:24
B-34	9	North	October 3, 2011	13:24
B-35	9	Northeast	October 3, 2011	13:24
B-36	10	Northeast	October 3, 2011	13:17
B-37	10	Northeast	October 3, 2011	13:17
B-38	11	Northwest	October 3, 2011	13:18
B-39	11	North	October 3, 2011	13:18
B-40	11	Northeast	October 3, 2011	13:18
B-41	11	Southeast	October 3, 2011	13:19
B-42	11	Southeast	October 3, 2011	13:19
B-43	Rock Outcropping	West	October 3, 2011	13:43
B-44	Rock Outcropping	North	October 3, 2011	13:43
B-45	Gauging Station	East	October 3, 2011	14:25



**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-01**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**

Photo Station No. 1



2

**Photo No.**  
**B-02**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
North

**Description:**

Photo Station No. 1





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-03**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 1



**Photo No.**  
**B-04**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
East

**Description:**

Photo Station No. 1





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-05**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
Southwest

**Description:**

Photo Station No. 2



**Photo No.**  
**B-06**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

Photo Station No. 2





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-07**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
East

**Description:**

Photo Station No. 2



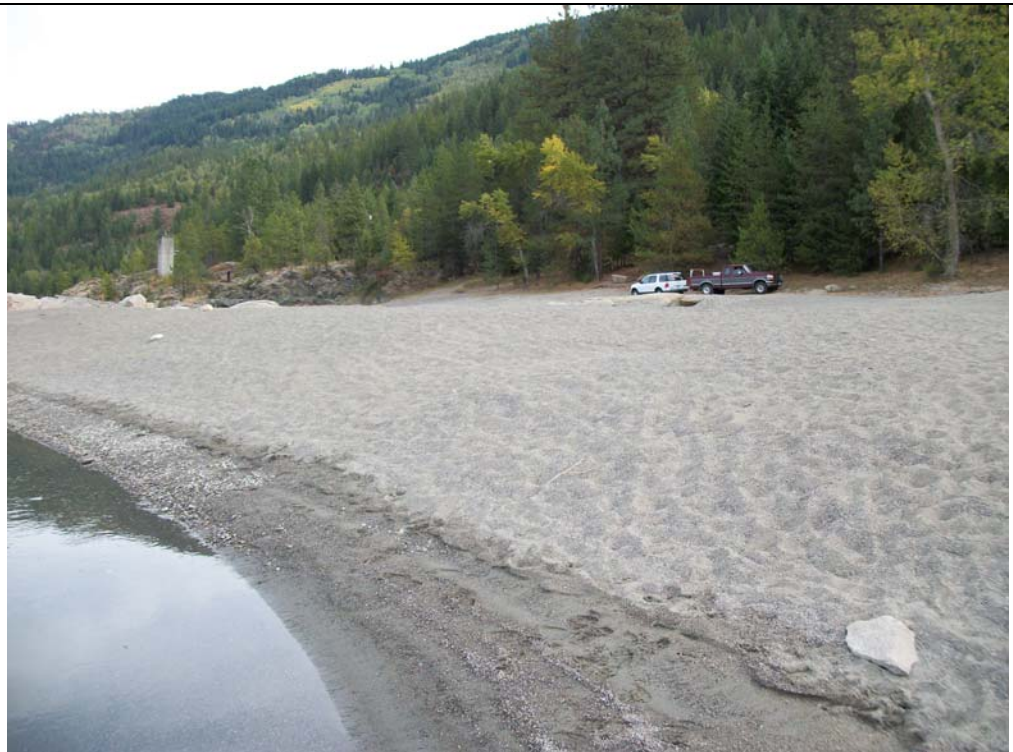
**Photo No.**  
**B-08**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
East

**Description:**

Photo Station No. 2







**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-09**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Southeast

**Description:**

Photo Station No. 2



2

**Photo No.**  
**B-10**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
South

**Description:**

Photo Station No. 2





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-11**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

**Description:**

Photo Station No. 3



**Photo No.**  
**B-12**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**

Photo Station No. 3





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-13**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
North

**Description:**

Photo Station No. 3

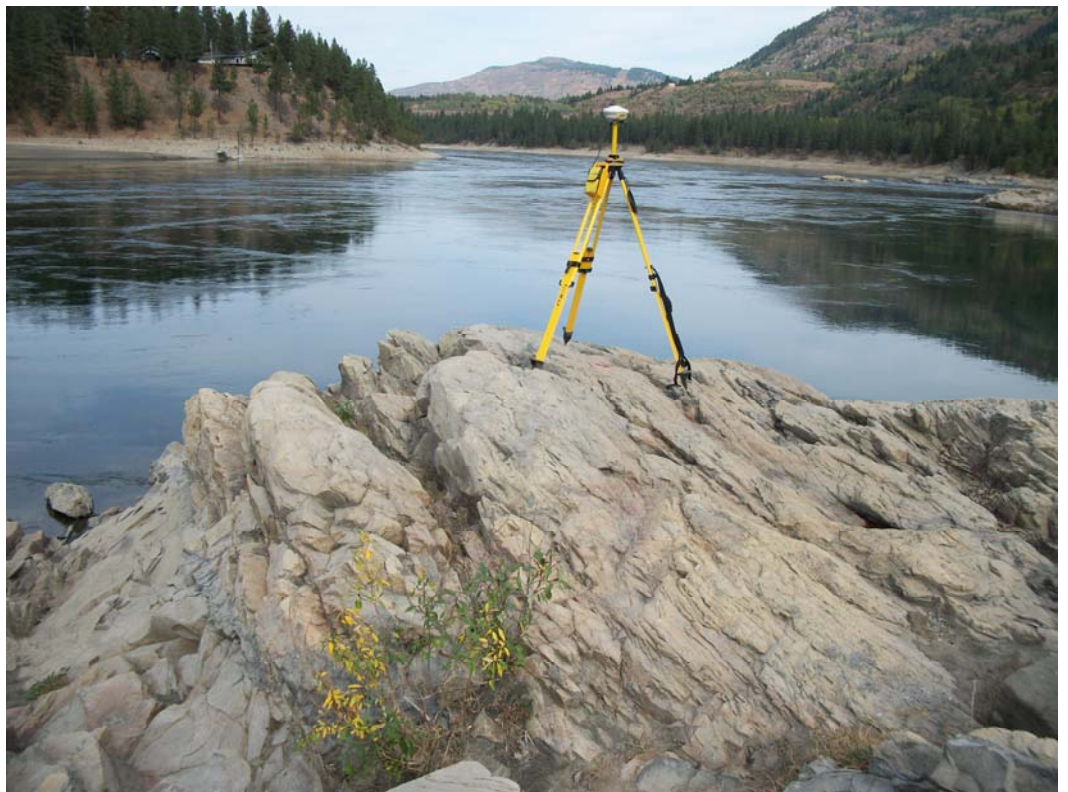


**Photo No.**  
**B-14**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

Photo Station No. 4





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-15**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Southwest

**Description:**

Photo Station No. 4



**Photo No.**  
**B-16**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
South

**Description:**

Photo Station No. 4



Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-17**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
South

**Description:**

Photo Station No. 4



2

**Photo No.**  
**B-18**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
North

**Description:**

Photo Station No. 5





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-19**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
East

**Description:**

Photo Station No. 5



**Photo No.**  
**B-20**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Southwest

**Description:**

Photo Station No. 5





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-21**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
Southwest

**Description:**

Photo Station No. 6



**Photo No.**  
**B-22**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

Photo Station No. 6





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-23**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 7



**Photo No.**  
**B-24**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
North

**Description:**

Photo Station No. 7





Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-25**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**

Photo Station No. 7



2

**Photo No.**  
**B-26**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

**Description:**

Photo Station No. 7





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-27**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

**Description:**

Photo Station No. 8



**Photo No.**  
**B-28**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**

Photo Station No. 8





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-29**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
North

**Description:**

Photo Station No. 8



**Photo No.**  
**B-30**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

Photo Station No. 8





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-31**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 8



**Photo No.**  
**B-32**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
East

**Description:**

Photo Station No. 8





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-33**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

**Description:**

Photo Station No. 9



2

**Photo No.**  
**B-34**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
North

**Description:**

Photo Station No. 9





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-35**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 9



**Photo No.**  
**B-36**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 10





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-37**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 10



**Photo No.**  
**B-38**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northwest

Photo Station No. 11





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-39**

**Photo Taken:**  
10/28/10

**Direction Taken:**  
North

**Description:**

Photo Station No. 11



**Photo No.**  
**B-40**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Northeast

**Description:**

Photo Station No. 11







**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-41**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Southeast

**Description:**

Photo Station No. 11



2

**Photo No.**  
**B-42**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
Southeast

**Description:**

Photo Station No. 11





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-43**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
West

**Description:**

Rock Outcropping



**Photo No.**  
**B-44**

**Photo Taken:**  
10/03/11

**Direction Taken:**  
North

**Description:**

Rock Outcropping





**APPENDIX B:  
SUPPLEMENTAL PHOTOGRAPHIC LOG**

Teck American  
Incorporated

**Black Sand Beach Project**  
Stevens County, Washington

**URS Project No.:**  
36310105

**Photo No.**  
**B-45**

**Photo Taken:**  
10/03/10

**Direction Taken:**  
East

**Description:**

Gauging Station

Gauge reads  
approximately 96.25',  
which corresponds to  
river elevation of  
approximately 1299.2'  
NAVD88.



**APPENDIX C**  
**LARGE PHOTOGRAPH MAPS**