

ENSR

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October 23, 2007

Jim Frechione
Contaminated Sites Program
Division of Spill Prevention and Response
Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709-3643

Subject: Costa Hill Repeater Closure Report**ENSR Project Number 00550-341**

Dear Mr. Frechione,

ENSR Corporation (ENSR) is pleased to submit this report on behalf of Mr. Larry Bamberger, AT&T Environmental, Health, and Safety Operations Manager, in support of a Conditional Closure determination for the Costa Hill Repeater. The following report presents the results of site assessment and remediation work conducted by ENSR at the Costa Hill Repeater and summarizes all field activities performed at the site, including a review of sampling results, data quality, and site management recommendations. This report is being submitted as a supplement to the Conditional Closure Report submitted to the Alaska Department of Environmental Conservation (ADEC) in April 2007 (finalized August 2007).¹

PROGRAM HISTORY

ENSR, on behalf of AT&T Inc. (AT&T), has been conducting site characterization and petroleum hydrocarbon contamination cleanup actions at AT&T microwave repeater facilities along the Trans-Alaska Pipeline System (TAPS). Environmental investigations began in 2002 when a Phase I Site Assessment at each of 26 repeater sites was conducted in accordance with American Society for Testing of Materials (ASTM) standards. Based on information obtained during the Phase I, a more comprehensive Phase II investigation was implemented for the repeaters. For the next 4 years, the AT&T TAPS Site Assessment/Remediation Program was conducted in accordance with discussions and decisions between AT&T, Alyeska Pipeline Services Co. (APSC), and ADEC Prevention and Emergency Response Program (PERP). Stakeholder meetings were held biannually to review site characterization findings and remedial excavation activities and agree to any required follow-up work. As a result, each year's site characterization (site assessment) and cleanup actions (remediation) were conducted based on field observations, field screening measurements, and analytical laboratory sampling results mutually agreed to by AT&T, APSC, and ADEC PERP staff. The program was also conducted in accordance with requirements as specified in Title 18 of the Alaska Administrative Code,

¹ ENSR. 2007. Trans-Alaska Pipeline System Repeaters AT&T Site Assessment/Remediation Program Conditional Closure Report. August. ENSR Doc. No. 00550341.

Chapter 75 (18 AAC 75), also known as the Oil and Hazardous Substances Pollution Control Regulations.

The programmatic elements and risk evaluation for Costa Hill were derived from the April 2007 report.¹ Figures illustrating the site location, facility layout, sampling locations, and field and analytical results are provided in Attachment 1. Laboratory analytical results from 2003 to the 2007 are provided in tables in Attachment 2. Site photos for each field visit are provided in Attachment 3. These attachments provide a historical reporting for the Costa Hill Repeater site investigation and remediation work. Attachment 4 includes photographs of AT&T current site refueling process.

The remediation program was conducted in accordance with the ADEC-approved Work Plan² and the requirements specified in State of Alaska regulations in 18 AAC 75.335.

INTRODUCTION

The Costa Hill Repeater (elevation 1,406 feet above mean sea level [AMSL]) is situated on a gently sloping hill west of the Sagavanirktok River (see attached figures). The site is located north of the Brooks Range near Pump Station 3 of the TAPS. The repeater is accessible only by helicopter. The facility consists of four aboveground storage tanks (ASTs), a generator module, a battery (equipment) module, and a microwave repeater tower. The ASTs are on pilings reportedly driven over 10 feet into the native ground. A layer of geofabric was encountered under the generator module and AST area; however, it did not underlie all of the AST area. Soils encountered at this site consisted of 6 to 9 inches of organic material, underlain by silt and sand with gravel. Bedrock was not encountered during the assessment. Permafrost is expected to be present within 3 feet below ground surface (bgs).

The Costa Hill repeater site was constructed in 1976 and is reported to be on State of Alaska-owned land within the TAPS corridor. According to the Site Plan, the current structure may have been moved approximately 20 feet north from a previous location. Historically, the ASTs are refueled annually by fuel bladders sling-loaded to the site by helicopter. The fuel bladder staging area is located approximately 15 feet south of the AST area and did not include any leak containment provisions.

In 2003, the ASTs and associated piping were completely retrofitted with new spill protection equipment. This retrofit included overfill protection, double wall supply and return lines, and other current performance based fuel system upgrades. The retrofit was followed by implementation of new best management practices for the fueling operations, including new procedures for the annual refueling operations. Currently, a portable secondary containment device is sling-loaded to the site prior to delivery of the fuel bladder and set up in designated areas near the ASTs. The bladders are subsequently placed inside the secondary containment during the refueling process. The secondary containment prevents any spillage during initial fuel line connections, fueling process and disconnection activities. Photographs of the refueling equipment and process are provided in Attachment 4.

Tundra vegetation is present throughout the site. Prior to field activities at the Costa Hill Repeater, tundra ponds adjacent to the AST area and the Battery Module were the nearest surface water at the site. During the initial site assessment activities it was apparent that the adjacent tundra ponds were not only a potential contaminant migration pathway to surface water, but they were also causing the permafrost below the AST and other areas to thaw, and destabilize the foundations of those structures. The rate of this thermal erosion was increasing as the size of the ponds grew larger with every annual freeze- thaw cycle. This created the potential for structural strain on the fuel system components which

² ENSR. 2003. Investigation and Remediation Memorandum Work Plan. May 1.

could lead to future fuel leakage. Further, any contaminated soils remaining under the AST structures could potentially migrate to surface water via the ponds. Consequently, AT&T determined the thermal erosion and site grade restoration must be addressed as part of the remediation program.

Under an approach developed by Larry Bamberger of AT&T, the tundra ponds were dewatered, backfilled, and graded for drainage. Each pond was dewatered using a pumping system and granular activated carbon (GAC) filters. The treated water was then discharged onto the surrounding tundra via a diffuser sprinkler system under a U.S. Army Corps of Engineers permit. After site and assessment activities were completed, the depression area of the former tundra ponds was backfilled with a combination of high-density Styrofoam board insulation, classified D-1 gravel fill, and native tundra material to promote the natural revegetation process. The backfill areas were graded to higher than surrounding areas to create positive drainage away from the structures. Details of the de-watering process are further described below. Presently the nearest surface water is in small tundra ponds that are located throughout the area

SUMMARY OF ENVIRONMENTAL WORK

Several areas of potential contamination, as indicated by field screening or soil staining, were identified at the repeater site during the multiple year site assessment and remediation program beginning in 2002. Each area is discussed separately in the following paragraphs.

Soil cleanup levels at the Costa Hill Repeater are established as ADEC Method One, Category D (1,000 mg/kg gasoline range organics [GRO], 2,000 mg/kg diesel range organics [DRO], and 2,000 mg/kg residual range organics [RRO]). Cleanup levels for GRO; benzene, toluene, ethylbenzene, and total xylenes (BTEX); and polycyclic aromatic hydrocarbon (PAH) compounds are adopted from the most stringent ADEC Method Two, Table B1 (under 40-inch zone) cleanup levels specific to ingestion, inhalation, and/or migration to groundwater pathways.³

Aboveground Storage Tanks

Field screening in the AST area indicated possible contamination under each of the four tanks. Contamination under the tanks is likely due to slow leakage over time and/or spillage at the tank fill valve during refueling. Very little contamination was encountered beneath ASTs 1 and 4. However, contamination was encountered beneath ASTs 2 and 3; and remedial excavations were conducted to the maximum extent practical.

Soils identified as contaminated were removed from the AST area. Excavations under ASTs 2 and 3 were extended until they reached permafrost at approximately 30 inches bgs. These excavations were advanced to the maximum extent practical without compromising the structural integrity of the tank footings (see attached photographs). Approximately 6 cubic yards of contaminated material was removed in 2004, and an additional 8 cubic yards were removed in 2005. Approximately 10 cubic yards of D-1 and native tundra material were used to backfill the excavation beneath the AST area in 2005.

Analytical samples collected from excavations and potentially contaminated soils remaining in the AST area reported concentrations of DRO in all samples, ranging from 16.3 mg/kg (estimated) to 2,950 mg/kg. The highest remaining DRO concentration at the site (2,950 mg/kg) was located beneath AST 3 adjacent to the vertical support mount at 32 inches bgs. No further excavation was possible at this

³ ENSR. 2003. Technical Memorandum: Proposed Petroleum Hydrocarbon Soil Cleanup Levels for TAPS Corridor Repeater Sites. August 18.

location without compromising the stability of the tank. Field screening and analytical results confirm that contaminated soils were removed to the extent practical from the AST area. Approximately 10 cubic yards of contaminated soil remains under the center and vertical support mounts of ASTs 2 and 3.

A tundra pond was present approximately 4 feet to the north of the AST area. In 2004, samples were collected from the surface water and reported DRO concentrations of 0.485 mg/kg and 0.498 mg/kg. In 2005 surface water samples were collected again and the DRO results were all estimated concentrations ranging from 0.224 mg/kg to 0.265 mg/kg. This pond was subsequently de-watered and backfilled as described below.

Generator Module Area

Potential contamination was identified beneath the north side of the Generator Module. Contamination in this area is likely the result of leaks where the fuel lines entered the Generator Module or from leaks within the Generator Module.

In 2004 excavations on the west half of the north side of the building were extended vertically and laterally until heated headspace (HHS)/PID results were below 10 parts per million (ppm) or to the extent practical without potentially compromising the integrity of the structure. Approximately 4 cubic yards of contaminated soil was removed from this area to a depth of approximately 16 inches bgs. An analytical sample collected from potentially contaminated soils remaining in place reported DRO concentrations of 813 mg/kg.

Field screening and analytical results indicate that little contaminated soil above the cleanup level remains under the generator module. PID samples ranged from 7.9 ppm to 87.2 ppm in the excavation beneath the generator module.

Approximately 3 cubic yards of D-1 and native tundra material were used to backfill the excavation beneath the generator module in 2004

Tundra Pond Dewatering

Under the approach described above, the tundra ponds were dewatered and backfilled in order to prevent additional destabilization of the footings and to prevent any residual contamination from migrating into the tundra ponds. The location of the dewatered tundra ponds are shown on figures in Attachment 1. The dewatering process was conducted in 2006 and 2007 under U.S. Army Corps of Engineers permit POA-2005-1528D. The surface water was pumped from the existing tundra ponds using a trash pump fitted with a pre-filter to prevent sediment and vegetation uptake. The trash pump then pumped the water to a four-outlet manifold. The manifold directed the water to four granular activated carbon (GAC) filters to remove any potential petroleum hydrocarbon compounds. Approximately 150 feet of discharge hose was connected to each GAC filter and the effluent was discharged downgradient through diffusers connected to the end of each discharge hose. After site and assessment activities were completed, the depression area of the former tundra ponds was backfilled with a combination of high-density Styrofoam board insulation, classified D-1 gravel fill, and native tundra material to promote the natural revegetation process. The backfill areas were graded to higher than surrounding areas to create positive drainage away from the structures. In 2006 and 2007 approximately 160 cubic yards of D-1 and native tundra material were used to backfill the depressions from the dewatered tundra ponds adjacent to the structures on site.

SUMMARY AND RECOMMENDATIONS

Bedrock was not encountered during the site investigation, but permafrost was encountered at approximately 24 to 30 inches bgs in the AST area. Surface water was observed in the vicinity of the site but was removed during the 2006 and 2007 field seasons. The source of contamination at this site is likely due to surface releases that occurred during fueling of the ASTs. The likelihood of future surface spills has been significantly reduced because the ASTs and associated piping were completely retrofitted with new spill protection equipment in 2003, and concurrently implemented new refueling procedures; now SOP for the TAPS refueling operations.

The Costa Hill Repeater site has been sufficiently characterized as a result of site assessment activities conducted during the program. Approximately 14 cubic yards of potentially contaminated soil was removed. Approximately 10 cubic yards of potentially contaminated material remain in the AST Area. All accessible contaminated material identified during the program has been removed.

In a meeting held on February 1, 2005, with ENSR, ADEC representatives, Alyeska Pipeline, and AT&T Corporation, all parties present agreed that a No Further Remedial Action Planned (NFRAP) determination is warranted for the Costa Hill Repeater Site. ENSR recommends that the Costa Hill Repeater site receive an NFRAP determination from the ADEC as all accessible contaminated material above the established cleanup levels has been removed from the site. Any residual contaminated material will not be encountered in the daily operation of the site, but the site should remain on the ADEC database in the event of site decommissioning in the future. Based on this information, ENSR respectfully requests a determination of Conditional Closure for the Slope Repeater site.

Sincerely yours,



Chris L. Humphrey, P.E.
Project Manager

ATTACHMENT 1: FIGURES

- Figure 1. Costa Hill Repeater Site Location
- Figure 2. No title [shows areas backfilled on site] (2007)
- Figure 2. No title [shows surface water and backfilled areas on site] (2007)
- Figure 1. Field Screening and Analytical Results (2005)
- Figure 1. Field and Analytical Results (2004)
- Figure 1. Field Screening and Analytical Results (2003)

ATTACHMENT 2: TABLES

- Table 1: 2005 Soil Sampling Analytical Results
- Table 2: 2004 Surface Water Sampling Analytical Results
- Table 1: 2004 Soil Sampling Analytical Results
- Table 1: 2003 Soil Sampling Analytical Results

Mr. Frechione
Page 6

ATTACHMENT 3: AT&T SITE PHOTOGRAPHS

ATTACHMENT 4: AT&T REFUELING PROCESS PHOTOGRAPHS

ATTACHMENT 1

FIGURES

Figure 1. Costa Hill Repeater Site Location

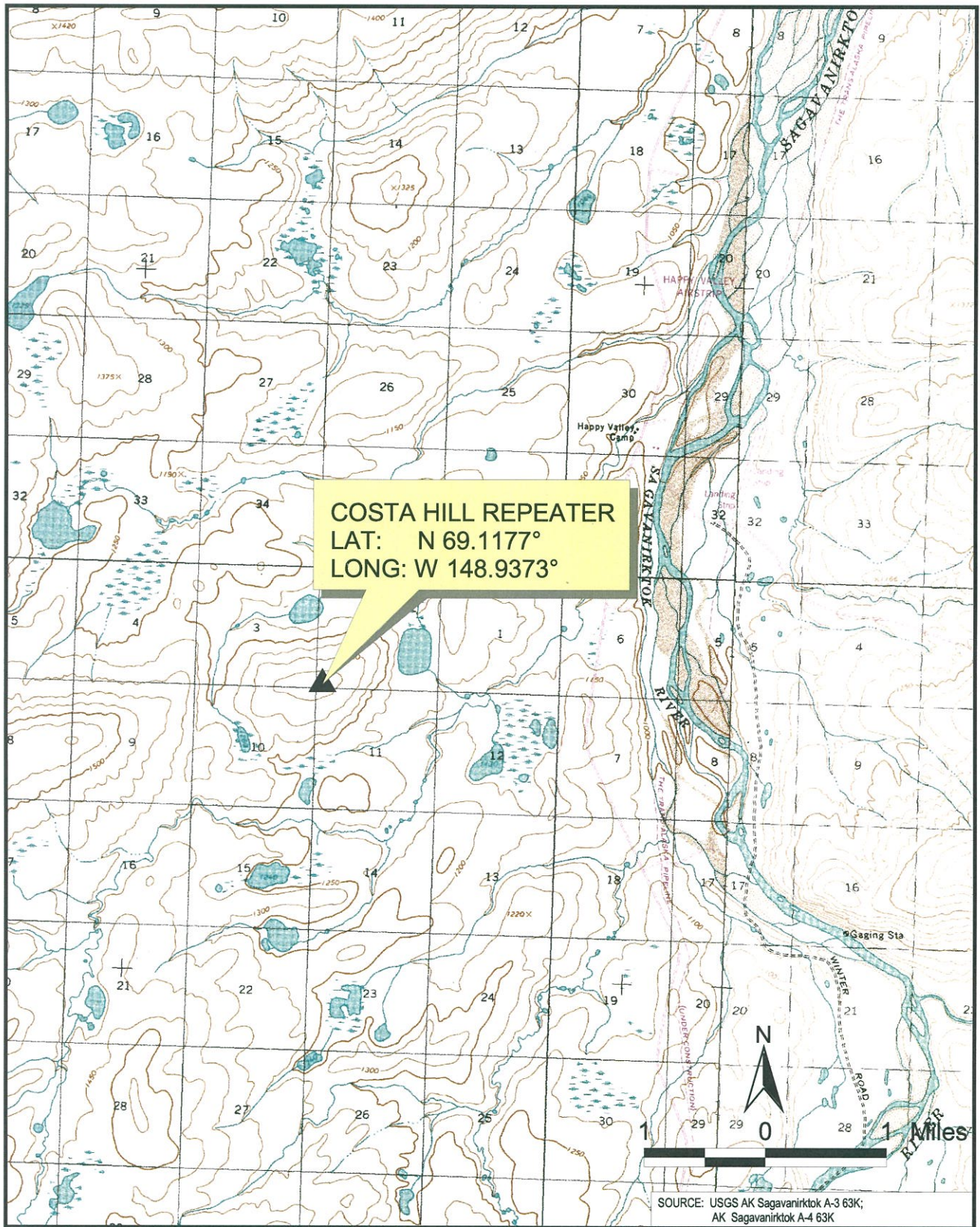
Figure 2. No title [shows areas backfilled on site] (2007)

Figure 2. No title [shows surface water and backfilled areas on site] (2007)

Figure 1. Field Screening and Analytical Results (2005)

Figure 1. Field and Analytical Results (2004)

Figure 1. Field Screening and Analytical Results (2003)



SOURCE: USGS AK Sagavanirktok A-3 63K;
AK Sagavanirktok A-4 63K

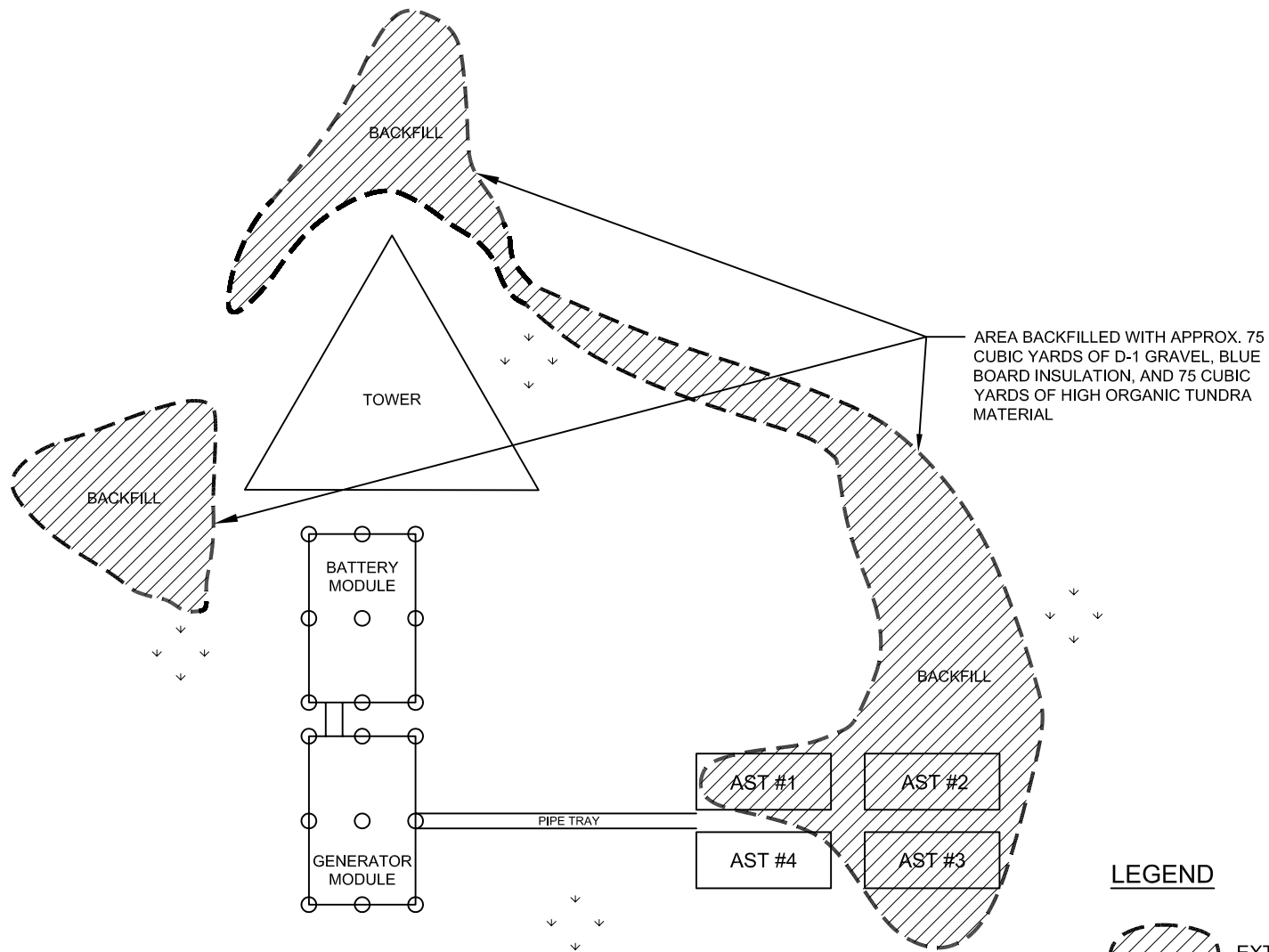
ENSR
INTERNATIONAL

1835 S. BRAGAW STREET, #490
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FAX: (907) 273-4555

FILE: AT&TRepeater DRAWN: JAH
VIEW: 02costa CHECK: MAJ
DATE: 01/14/04 P.M.: M. JONES

FIGURE 1
COSTA HILL REPEATER
SITE LOCATION

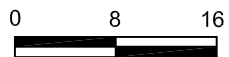
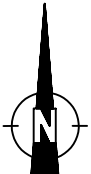
AT&T CORPORATION
PHASE III SITE ASSESSMENTS/
REMEDATION PROGRAM
TAPS REPEATER SITES
PROJECT 00550-338-1500




LEGEND

 EXTENT OF BACKFILL AREA

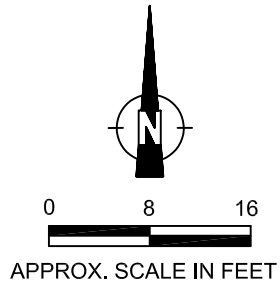
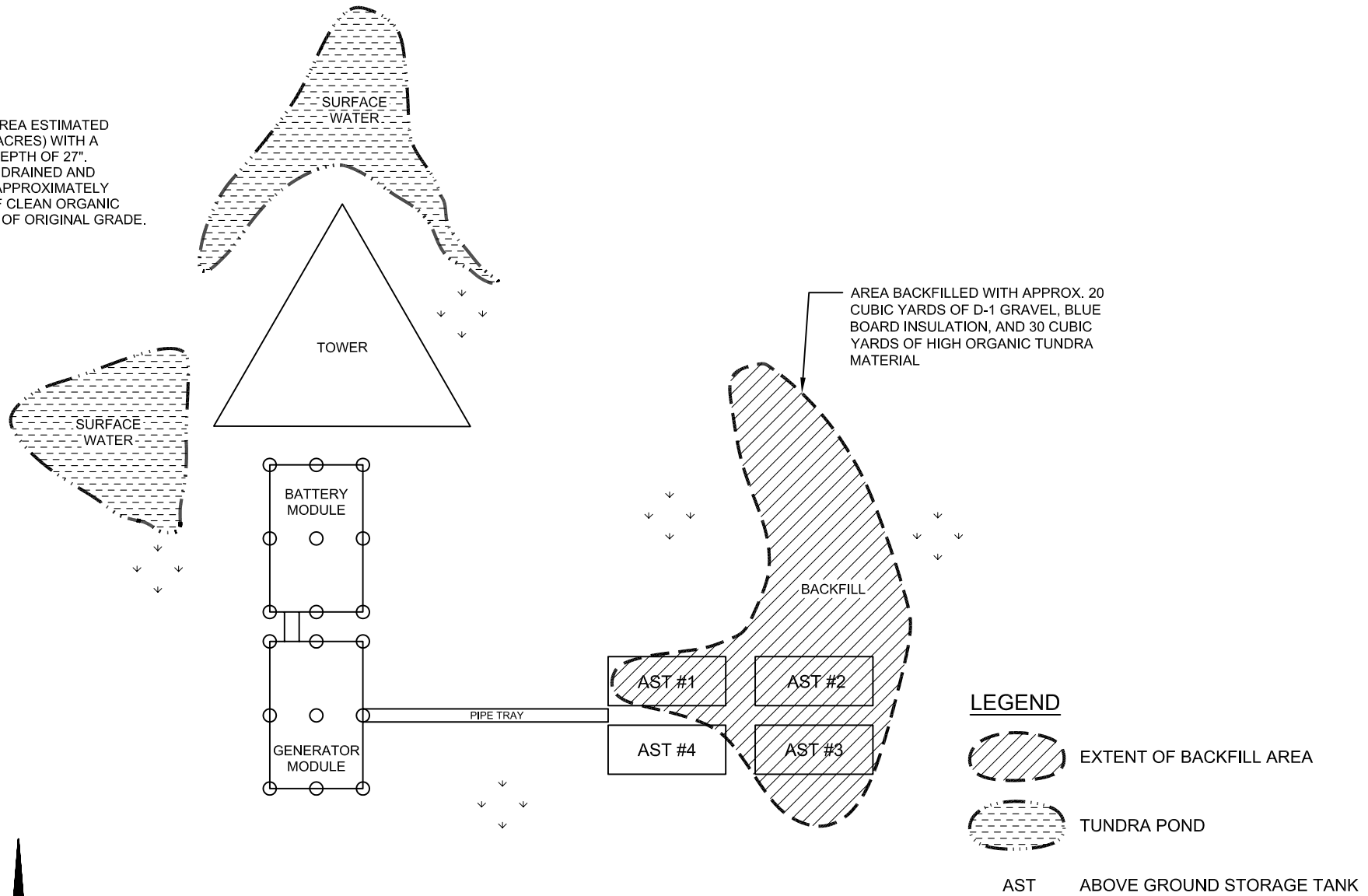
AST ABOVE GROUND STORAGE TANK



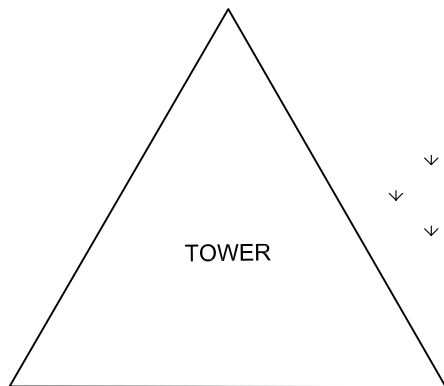
APPROX. SCALE IN FEET

		COSTA HILL REPEATER		FIGURE NUMBER: 2
		AT&T 2007 Field Program T4N R13E SEC 2 UMIAT MERIDIAN		
ENSR CORPORATION 1835 SOUTH BRAGAW STREET SUITE 490 ANCHORAGE, ALASKA 99512 PHONE: (907) 561-5700 FAX: (907) 273-4555 WEB: HTTP://WWW.ENSR.AECOM.COM	DRAWN BY: KM	DATE: 09/11/07	PROJECT NUMBER: 00550-341-2000	CHECKED BY: JS

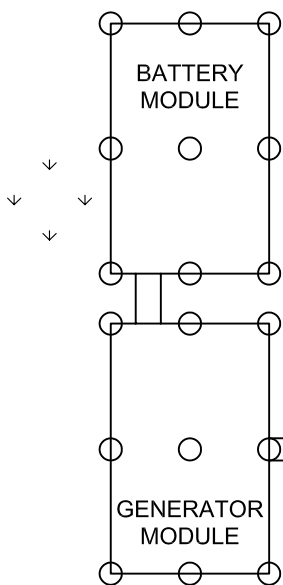
SURFACE WATER AREA ESTIMATED AT 488 sq. ft. (0.011 ACRES) WITH A MAXIMUM WATER DEPTH OF 27". THIS AREA WILL BE DRAINED AND BACKFILLED WITH APPROXIMATELY 40 CUBIC YARDS OF CLEAN ORGANIC FILL TO WITHIN ± 6" OF ORIGINAL GRADE.



		COSTA HILL REPEATER		FIGURE NUMBER: 2
		AT&T 2007 Field Program T4N R13E SEC 2 UMIAT MERIDIAN		
ENSR CORPORATION 1835 SOUTH BRAGAW STREET SUITE 490 ANCHORAGE, ALASKA 99512 PHONE: (907) 561-5700 FAX: (907) 273-4555 WEB: HTTP://WWW.ENSR.AECOM.COM	DRAWN BY: KM	DATE: 05/21/07	PROJECT NUMBER: 00550-341-2000	CHECKED BY: JS



TOWER



BATTERY
MODULE

GENERATOR
MODULE

PIPE TRAY

APPROXIMATELY 16 CUBIC YARDS
OF PETROLEUM HYDROCARBON
CONTAMINATED MATERIAL REMAIN

COST05	26" bgs
DRO	1,200
RRO	1,430

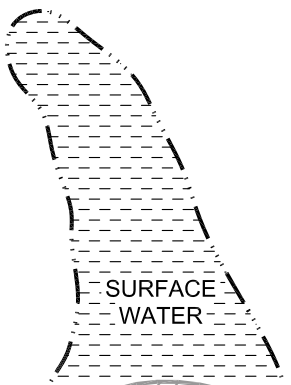
APPROXIMATELY 12 CUBIC YARDS
OF PETROLEUM HYDROCARBON
CONTAMINATED MATERIAL WAS
REMOVED FROM THIS AREA TO
A DEPTH OF 2 FEET (PERMAFROST)



AST #1



AST #4



SURFACE
WATER



AST #2



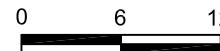
AST #3

COST02	16" bgs
DRO	1,580
RRO	1,180

COST03	32" bgs
DRO	2,950
RRO	599

COST04	20" bgs
DRO	179
RRO	1,290

COST01	26" bgs
DRO	1,160
RRO	1,210



APPROX. SCALE IN FEET

LEGEND

- LAB SAMPLE LOCATION
- 2005 AREA OF EXCAVATION
- ESTIMATED AREA OF CONTAMINATION ABOVE 2000 mg/Kg
- SURFACE WATER
- BGS BELOW GROUND SURFACE
- DRO DIESEL RANGE ORGANICS (mg/Kg)
- RRO RESIDUAL RANGE ORGANICS (mg/Kg)
- AST ABOVE GROUND STORAGE TANK
- PPM HEATED HEAD SPACE/PARTS PER MILLION
- mg/Kg MILIGRAMS PER KILOGRAM

NOTES

1. ONLY ANALYTICAL RESULTS FOR COMPOUNDS OF POTENTIAL CONCERN ARE SHOWN.



1835 SOUTH BRAGAW STREET, SUITE 490
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(907) 561-5700
FAX: (907) 273-4555

FILE: 21COSTA05
C/SC: 1:12
DATE: 09/14/05

DRAWN: MS/KM
ZIP: NA
CHECK: J. SCHICK

FIGURE 1
COSTA HILL REPEATER
FIELD SCREENING AND
ANALYTICAL RESULTS

2005 AT&T PHASE V
SITE ASSESSMENT/
REMEDIAION PROGRAM

PROJECT 00550-338-100

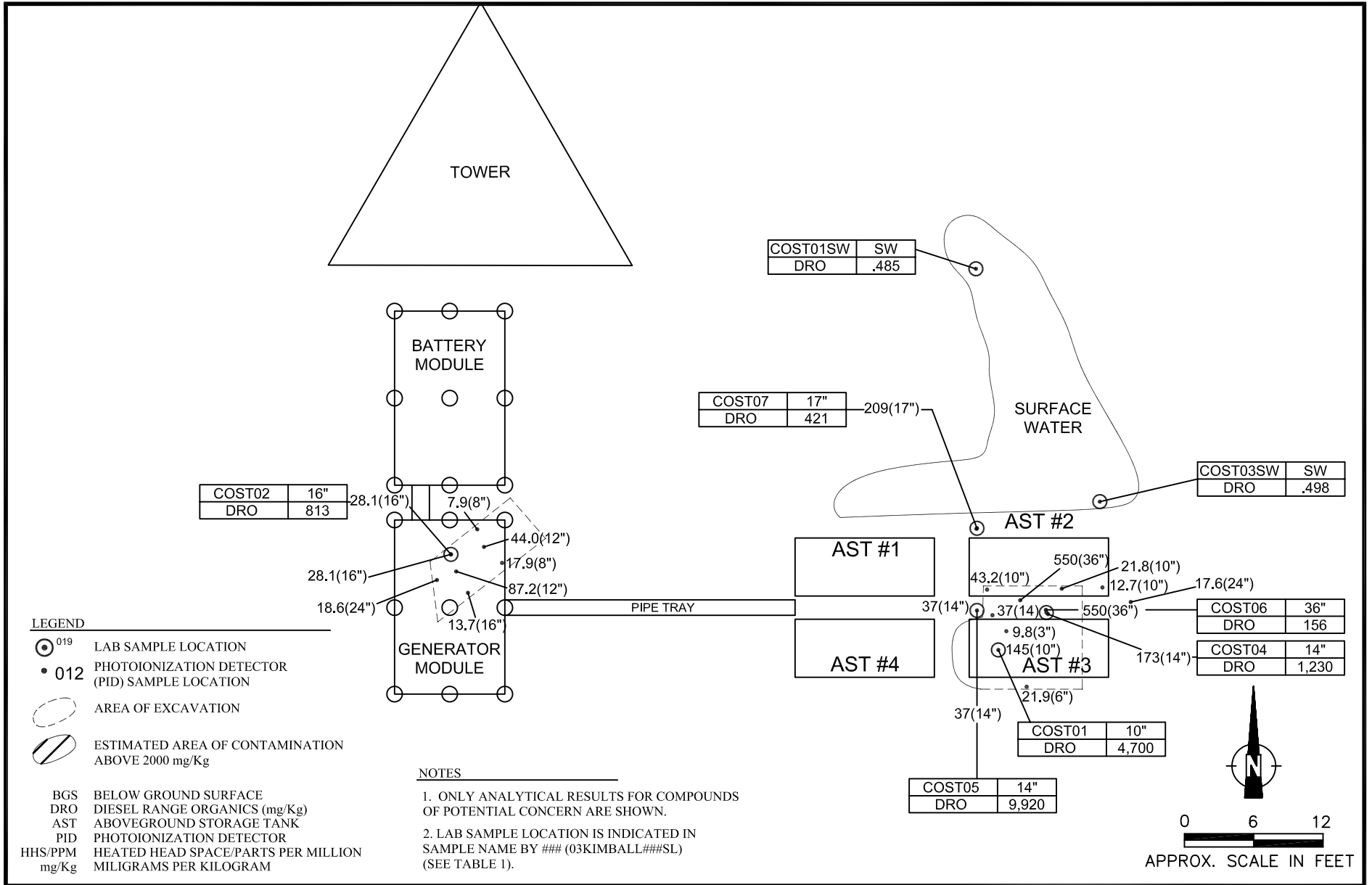


FIGURE 1
COSTA HILL REPEATER
FIELD AND ANALYTICAL RESULTS

2004 AT&T PHASE IV
SITE ASSESSMENT/
REMEDATION PROGRAM

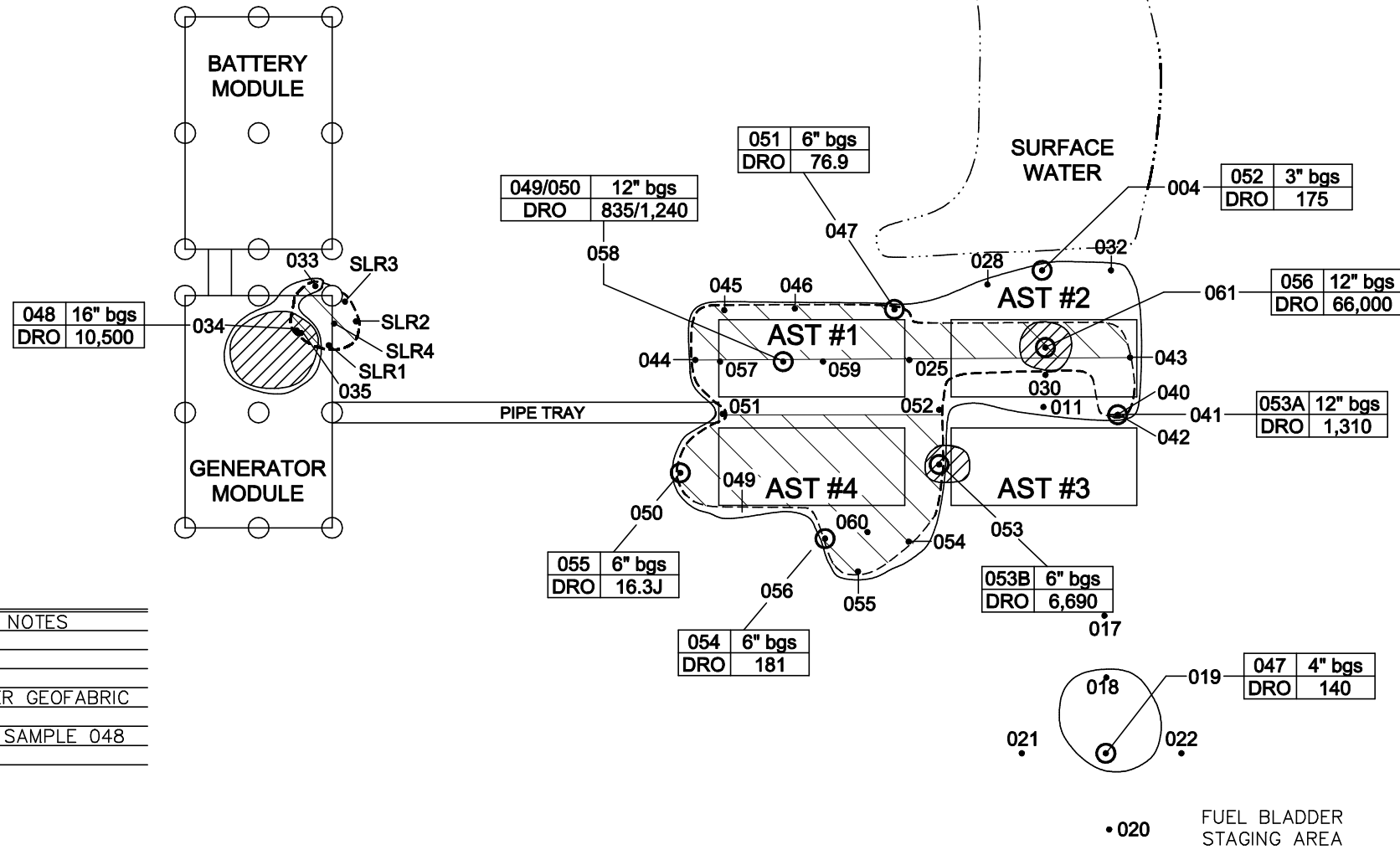
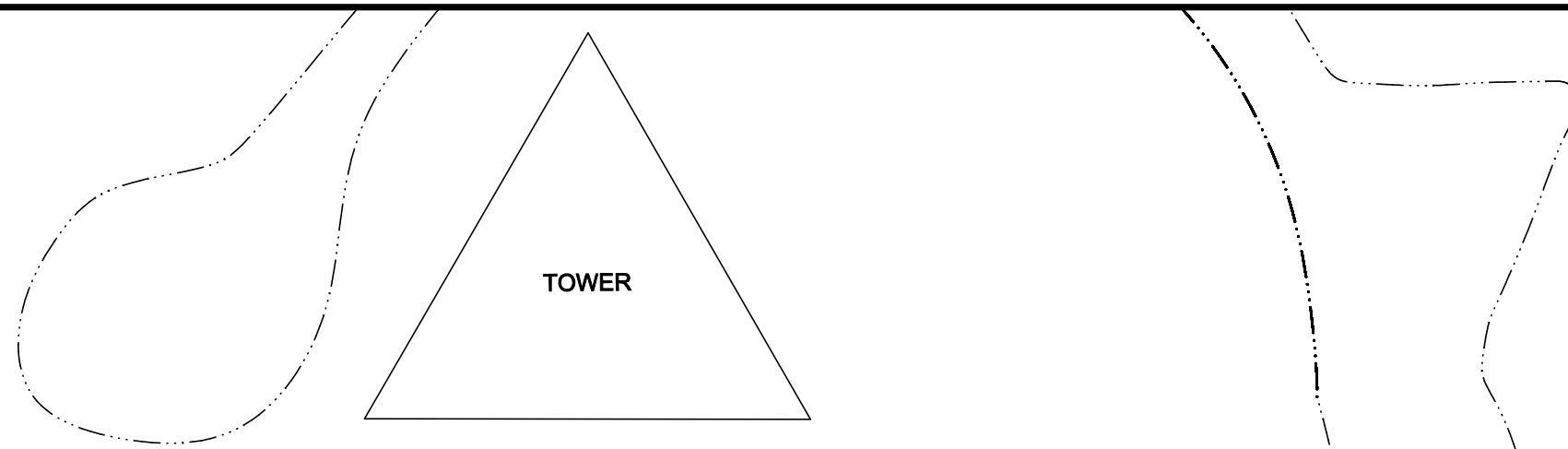
PROJECT 00550-330-1500



1835 SOUTH BRAGAW STREET, SUITE 490
 ANCHORAGE, AK 99512
 (907) 561-5700
 FAX: (907) 273-4555

FILE: 06STUCK
C/SC: 1:1PS
DATE: 08/06/04

DRAWN: MNA
ZIP: NA
CHECK: J.SCHICK



PID RESULTS
GENERATOR MODULE AREA

Sample#	"bgs	HHS/PPM	NOTES
SLR1	6	0.5	
SLR2	6	2.0	
SLR3	6	0.8	
SLR4	15	1.5	UNDER GEOFABRIC
033	16	12.0	
034	16	156	LAB SAMPLE 048
035	6	113	

PID RESULTS
AST AREA

Sample#	"bgs	HHS/PPM	NOTES
004	3	94.4	LAB SAMPLE 052
011	3	16.5	
025	6	17.1	
028	3	18.1	
030	6	25.0	
032	3	20.2	
040	6	16.2	
041	12	16.8	LAB SAMPLE 053A
042	15	34.4	
043	9	17.5	
044	6	13.2	
045	6	11.1	
046	6	13.7	
047	6	17.0	LAB SAMPLE 051
049	6	16.6	
050	6	10.2	LAB SAMPLE 055
051	6	12.5	
052	6	14.1	
053	6	37.0	LAB SAMPLE 053B
054	6	27.9	
055	6	15.3	
056	6	46.3	LAB SAMPLE 054
057	12	103	
058	12	106	LAB SAMPLE 049/050
059	12	30.3	
060	9	32.8	
061	12	1581	LAB SAMPLE 056

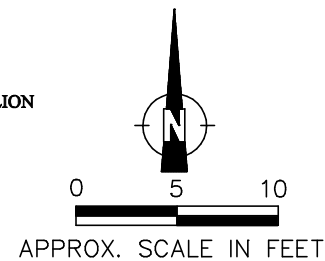
PID RESULTS
FUEL BLADDER STAGING AREA

Sample#	"bgs	HHS/PPM	NOTES
017	4	2.6	
018	4	31.2	
019	4	251	LAB SAMPLE 047
020	4	7.1	
021	4	2.9	
022	4	7.8	

- LEGEND**
- ⊙ LAB SAMPLE LOCATION
 - 012 PID SAMPLE LOCATION
 - ESTIMATED AREA ABOVE 10 HHS/PPM
 - ⊖ ESTIMATED AREA OF CONTAMINATION ABOVE 2,000 mg/Kg
 - ⊖ EXCAVATION BOUNDARY
 - ▨ GEOFABRIC

- NOTES**
- ONLY PID RESULTS FOR SOILS THAT REMAIN ARE SHOWN UNLESS NOTED OTHERWISE.
 - ONLY ANALYTICAL RESULTS FOR COMPOUNDS OF POTENTIAL CONCERN ARE SHOWN.
 - LAB SAMPLE LOCATION IS INDICATED IN SAMPLE NAME BY ### (03COSTA###SL) (SEE TABLE 1).
 - THE ACTUAL FOOTPRINT WHERE THE BLADDER IS PLACED IS BELIEVED TO FLUCTUATE DUE TO THE NATURE OF HELICOPTER SLING LOAD OPERATIONS

- KEY**
- AST ABOVEGROUND STORAGE TANK
 - bgs BELOW GROUND SURFACE
 - DRO DIESEL RANGE ORGANICS (mg/Kg)
 - HHS/PPM HEATED HEAD SPACE/PARTS PER MILLION
 - J ESTIMATED VALUE
 - mg/Kg MILLIGRAMS PER KILOGRAM
 - PID PHOTOIONIZATION DETECTOR
 - SLR1 PID SAMPLE FROM SLR CONSULTANT (NOT ALL SLR RESULTS ARE SHOWN)



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2003 AT&T PHASE II
FOLLOW-ON WORK/
REMEDATION PROGRAM
PROJECT 00550-338-1500

FIGURE 2
COSTA HILL REPEATER
FIELD SCREENING AND
ANALYTICAL RESULTS

DATE: 01/29/04	DRAWN BY: K. MONGAR	SCALE: AS SHOWN	FILE: 21COSTA
C/SC: 1:1PS	ZIP: NA	P.M.: E. WESTLIEN	CHECKED: A. POST
			PROJECT: 00550-338-1500

ATTACHMENT 2

TABLES

Table 1: 2005 Soil Sampling Analytical Results

Table 2: 2004 Surface Water Sampling Analytical Results

Table 1: 2004 Soil Sampling Analytical Results

Table 1: 2003 Soil Sampling Analytical Results

**Table 1: 2005 Soil Sampling Analytical Results, AT&T Phase V Site Assessment / Remediation Program
Costa Hill Repeater Site**

			Costa Hill				
	Sample ID:		05COST01SL	05COST02SL	05COST03SL	05COST04SL	05COST05SL
	Sample Date:		7/25/2005	7/25/2005	7/26/2005	7/26/2005	7/26/2005
	Sample QC Type:						
	Laboratory ID(s):		1054568019	1054568020	1054568021	1054568022	1054568023
Parameter	Units	MCL					
Bulk Petroleum Hydrocarbons [AK102, AK103]							
Diesel Range Organics	mg/kg	2,000	1,160 [76.3]	1,580 [203]	2,950 [413]	179 [55.3]	1,200 [137]
Residual Range Organics	mg/kg	2,000	1,210 [76.3]	1,180 [203]	599 [413]	1,290 [55.3]	1,430 [137]

Key:

MCL = minimum ADEC soil cleanup level per 18AAC75.341 with the following codes:
na = not applicable.

Notes:

Values in brackets [] are PQLs.
Values in **bold** indicate exceedance of the ADEC Cleanup Level.

**Table 2: 2004 Surface Water Sampling Analytical Results, AT&T Phase IV Site Assessment / Remediation Program
Costa Hill Repeater Site**

		Sample ID:		04COST01SW	04COST02SW	04COST03SW
		Sample Date:		7/9/2004	7/9/2004	7/9/2004
		Sample QC Type:				Dup of 04COST02SW
		Laboratory ID(s):		1044108005	1044108006	1044108007
		Cleanup				
Parameter	Units	Level				
Petroleum Hydrocarbons [AK102, AK103]						
Diesel Range Organics	mg/L	1.5	G	0.484 [0.345] B	0.447 [0.309] B	0.498 [0.361] B
Residual Range Organics	mg/L	1.1	G	1.06 [0.575] B	0.793 [0.515] B	1.44 [0.602] B
Volatile Organic Compounds by GC/MS [SW8260B]						
Benzene	mg/L	0.005	G	ND (0.00012) [0.0004]	ND (0.00012) [0.0004]	ND (0.00012) [0.0004]
Ethylbenzene	mg/L	0.7	G	ND (0.00031) [0.001]	ND (0.00031) [0.001]	ND (0.00031) [0.001]
o-Xylene	mg/L	10	G	ND (0.00031) [0.001]	ND (0.00031) [0.001]	ND (0.00031) [0.001]
Toluene	mg/L	1	G	ND (0.00031) [0.001]	ND (0.00031) [0.001]	ND (0.00031) [0.001]
Xylene, Isomers m & p	mg/L	10	G	ND (0.00062) [0.002]	ND (0.00062) [0.002]	ND (0.00062) [0.002]

Key:

- = Analysis not performed on this sample.
- J = Result is considered an estimate value.
- B = Compound additionally found present in the associated method blank.
- B = Value is considered biased-high from laboratory-introduced contamination.
- G = ADEC 18AAC75.345 Table C, Groundwater Cleanup Levels.
- ND = analyte not detected above the practical quantitation limit (PQL).
- na = no cleanup level applicable for this parameter.

Notes:

- Values in brackets [] are PQLs and values in parentheses () are laboratory detection limits.
- Values in **bold** indicate exceedance of the ADEC Cleanup Level.

**Table 1: 2004 Soil Sampling Analytical Results, AT&T Phase IV Site Assessment / Remediation Program
Costa Hill Repeater Site**

Parameter	Units	Sample ID: Sample Date: Sample QC Type: Laboratory ID(s): Cleanup Level	04COST01SL 7/8/2004 1044106013	04COST02SL 7/8/2004 1044106014	04COST03SL 7/8/2004 Dup of 04COST02SL 1044106015	04COST04SL 7/9/2004 1044106016
Petroleum Hydrocarbons [AK102, AK103]						
Diesel Range Organics	mg/kg	2,000 E	4700 [219]	813 [241]	221 [24.5]	1230 [202]
Residual Range Organics	mg/kg	2,000 E	655 [219]	639 [241]	259 [24.5]	524 [202]
Volatile Organic Compounds [SW8260B]						
Benzene	mg/kg	13 H	ND (0.00266) [0.00888]	--	--	ND (0.00292) [0.00973]
Ethylbenzene	mg/kg	89 H	0.00597 [0.0171] J	--	--	0.00599 [0.0187] J
o-Xylene	mg/kg	81 H	0.00683 [0.0171] J	--	--	0.0101 [0.0187] J
Toluene	mg/kg	180 H	0.0466 [0.0341]	--	--	ND (0.0112) [0.0374]
Xylene, Isomers m & p	mg/kg	81 H	0.0184 [0.0341] J	--	--	0.0249 [0.0374] J
Total Solids [A2540G]						
Total Solids	mg/kg	na	83	75.1	70.8	89.5

Key:

-- = Analysis not performed on this sample.

J = Result is considered an estimate value.

H = inhalation pathway: ADEC Method Two Table B1.

E = See Technical Memorandum: Proposed Petroleum Hydrocarbon Cleanup Levels for TAPS Corridor Sites (August 18, 2003).

ND = analyte not detected above the practical quantitation limit (PQL).

Notes:

Values in brackets [] are PQLs and values in parentheses () are laboratory detection limits.

Values in **bold** indicate exceedance of the ADEC Cleanup Level.

**Table 1: 2004 Soil Sampling Analytical Results, AT&T Phase IV Site Assessment / Remediation Program
Costa Hill Repeater Site**

Parameter	Units	Cleanup Level	Sample ID: Sample Date: Sample QC Type: Laboratory ID(s):	04COST05SL 7/9/2004 1044106017	04COST06SL 7/9/2004 1044106020	04COST07SL 7/9/2004 1044106021
Petroleum Hydrocarbons [AK102, AK103]						
Diesel Range Organics	mg/kg	2,000	E	9920 [889] J	156 [26.8]	421 [82.4]
Residual Range Organics	mg/kg	2,000	E	2250 [889] J	636 [26.8]	1330 [82.4]
Volatile Organic Compounds [SW8260B]						
Benzene	mg/kg	13	H	ND (0.0053) [0.0177]	ND (0.00591) [0.0197]	ND (0.0101) [0.0337]
Ethylbenzene	mg/kg	89	H	0.021 [0.0339] J	ND (0.0118) [0.0379]	0.176 [0.0648]
o-Xylene	mg/kg	81	H	0.0289 [0.0339] J	ND (0.0118) [0.0379]	4.76 [0.0648]
Toluene	mg/kg	180	H	0.0384 [0.0679] J	ND (0.0227) [0.0757]	0.0998 [0.130] J
Xylene, Isomers m & p	mg/kg	81	H	0.0418 [0.0679] J	ND (0.0227) [0.0757]	3.45 [0.130]
Total Solids [A2540G]						
Total Solids	mg/kg	na		79.8	64.8	40.9

Key:

-- = Analysis not performed on this sample.

J = Result is considered an estimate value.

H = inhalation pathway: ADEC Method Two Table B1.

E = See Technical Memorandum: Proposed Petroleum Hydrocarbon Cleanup Levels for TAPS Corridor Sites (August 18, 2003).

ND = analyte not detected above the practical quantitation limit (PQL).

Notes:

Values in brackets [] are PQLs and values in parentheses () are laboratory detection limits.

Values in **bold** indicate exceedance of the ADEC Cleanup Level.

Table 1. Costa Hill Repeater, 2003 Soil Sampling Analytical Results, AT&T Phase III Site Assessment Program.

Location:		Fuel Bladder Staging	Under Gen. Mod.	AST #1 Center		AST #1 North Edge	
Sample ID:		03COSTA047SL	03COSTA048SL	03COSTA049SL	03COSTA050SL	03COSTA051SL	
Depth (bgs):		0" bgs	16" bgs	12" bgs		6" bgs	
Sample Date:		8/7/2003	8/8/2003	8/8/2003	8/8/2003	8/8/2003	
Sample QC Type:					Dup of 049SL		
Laboratory ID(s):		1034288005	1034288006	1034288007	1034288008	1034288009	
Parameter	Units						
Cleanup Level							
Bulk Petroleum Hydrocarbons [AK102, AK103]							
Diesel Range Organics	mg/kg	2,000 E	140 [25]	10,500 [1,720]	835 [33.6]	1,240 [255]	76.9 [38]
Residual Range Organics	mg/kg	2,000 E	179 [25]	697 [1,720] J	61.5 [33.6]	ND [255]	164 [38]
Volatile Organic Compounds [8260B]							
Benzene	mg/kg	13 H	0.0366 [0.0284]	ND [0.0502]	ND [0.0096]	ND [0.0106]	--
Ethylbenzene	mg/kg	89 H	1.3000 [0.1090]	ND [0.1930]	0.0146 [0.0371] J	0.0199 [0.0406] J	--
o-Xylene	mg/kg	81 H	2.7800 [0.1090]	ND [0.1930]	0.0302 [0.0371] J	0.0575 [0.0406]	--
Toluene	mg/kg	180 H	0.0858 [0.1090] J	ND [0.1930]	0.0641 [0.0371]	0.0457 [0.0406]	--
Xylene, Isomers m & p	mg/kg	81 H	4.5500 [0.1090]	ND [0.1930]	0.0487 [0.0371]	0.0593 [0.0406]	--
Polycyclic Aromatic Hydrocarbons (PAHs) [PAHSIM]							
Acenaphthene	mg/kg	8,200 G	0.0264 [0.00813]	0.899 [0.163]	ND [0.00532]	ND [0.00585]	--
Acenaphthylene	mg/kg	8,200 G	ND [0.00813]	ND [0.163]	ND [0.00532]	ND [0.00585]	--
Anthracene	mg/kg	41,000 G	ND [0.00813]	ND [0.00817]	ND [0.00532]	ND [0.00585]	--
Benzo(a)anthracene	mg/kg	15 G	ND [0.00813]	ND [0.00817]	0.00183 [0.00532] J	ND [0.00585]	--
Benzo(a)pyrene	mg/kg	1.5 G	ND [0.00813]	ND [0.00817]	ND [0.00532]	ND [0.00585]	--
Benzo(b)fluoranthene	mg/kg	15 G	ND [0.00813]	ND [0.00817]	0.00219 [0.00532] J	0.00514 [0.00585] J	--
Benzo(g,h,i)perylene	mg/kg	4100 G	0.0101 [0.00813]	0.00677 [0.00817] J	ND [0.00532]	0.00222 [0.00585] J	--
Benzo(k)fluoranthene	mg/kg	150 G	ND [0.00813]	ND [0.00817]	ND [0.00532]	ND [0.00585]	--
Chrysene	mg/kg	1,500 G	ND [0.00813]	0.00556 [0.00817] J	0.00243 [0.00532] J	0.00382 [0.00585] J	--
Dibenzo(a,h)anthracene	mg/kg	1.5 G	ND [0.00813]	ND [0.00817]	ND [0.00532]	ND [0.00585]	--
Fluoranthene	mg/kg	5,500 G	ND [0.00813]	0.00506 [0.00817] J	0.00247 [0.00532] J	0.00488 [0.00585] J	--
Fluorene	mg/kg	5,500 G	0.0529 [0.00813]	1.75 [0.163]	0.0194 [0.00532]	0.0360 [0.00585]	--
Indeno(1,2,3-cd)pyrene	mg/kg	15 G	ND [0.00813]	ND [0.00817]	ND [0.00532]	ND [0.00585]	--
Naphthalene	mg/kg	180 H	0.489 [0.0813]	1.06 [0.163]	0.0605 [0.0532]	0.124 [0.0585]	--
Phenanthrene	mg/kg	41000 G	0.0110 [0.00813]	0.469 [0.163]	0.00465 [0.00532] J	0.00950 [0.00585]	--
Pyrene	mg/kg	4,100 G	ND [0.00813]	0.00745 [0.00817] J	0.00317 [0.00532] J	0.00614 [0.00585]	--
Total Solids [A2540G]							
Total Solids	%	na	82.2	64.2	87.0	83.7	65.8

Key:

-- = analysis not performed on this sample.

bgs = below ground surface.

Cleanup Level = Proposed in August 18, 2003 Memo or Method Two Table B1, Arctic Zone (18AAC75.341) with the following codes specifying pathway: G = ingestion pathway; H = Inhalation pathway.

E = See Technical Memorandum: Proposed Petroleum Hydrocarbon Soil Cleanup Levels for TAPS Corridor Repeater Sites (August 18, 2003).

J = result is considered an estimate value.

na = no cleanup level applicable for this parameter.

ND = parameter not detected above the method quantitation limit (MQL).

Notes:

Values in brackets are MQLs.

Values in Bold indicate exceedance of the ADEC Cleanup Level.

Table 1. Costa Hill Repeater, 2003 Soil Sampling Analytical Results, AT&T Phase III Site Assessment Program (Continued).

Location:			North of AST #2	Between AST#2&3	AST #3 Valve Area	South of AST #4	West of AST #4	AST #2 Center
Sample ID:			03COSTA052SL	03COSTA053SLA	03COSTA053SLB	03COSTA054SL	03COSTA055SL	03COSTA056SL
Depth (bgs):			0" bgs	12" bgs	6" bgs	6" bgs	6" bgs	12" bgs
Sample Date:			8/8/2003	8/8/2003	8/8/2003	8/8/2003	8/8/2003	8/8/2003
Sample QC Type:								
Laboratory ID(s):			1034288010	1034288011	1034288012	1034288013	1034288014	1034288017
Cleanup Level								
Parameter	Units							
Bulk Petroleum Hydrocarbons [AK102, AK103]								
Diesel Range Organics	mg/kg	2,000 E	175 [30]	1,310 [234]	6,690 [318]	181 [28]	16.3 [22.8] J	66,000 [3,470]
Residual Range Organics	mg/kg	2,000 E	143 [30]	1,070 [234]	193 [318] J	519 [28]	61.4 [22.8]	2,190 [3,470] J
Volatile Organic Compounds [8260B]								
Benzene	mg/kg	13 H	--	--	--	--	--	ND [0.0754]
Ethylbenzene	mg/kg	89 H	--	--	--	--	--	8.08 [0.290]
o-Xylene	mg/kg	81 H	--	--	--	--	--	53.0 [2.90]
Toluene	mg/kg	180 H	--	--	--	--	--	1.52 [0.290]
Xylene, Isomers m & p	mg/kg	81 H	--	--	81 H	--	--	73.0 [2.90]
Polycyclic Aromatic Hydrocarbons (PAHs) [PAHSIM]								
Acenaphthene	mg/kg	8,200 G	--	--	--	--	--	5.91 [3.31]
Acenaphthylene	mg/kg	8,200 G	--	--	--	--	--	ND [3.31]
Anthracene	mg/kg	41,000 G	--	--	--	--	--	ND [0.166]
Benzo(a)anthracene	mg/kg	15 G	--	--	--	--	--	ND [0.166]
Benzo(a)pyrene	mg/kg	1.5 G	--	--	--	--	--	ND [0.166]
Benzo(b)fluoranthene	mg/kg	15 G	--	--	--	--	--	ND [0.166]
Benzo(g,h,i)perylene	mg/kg	4100 G	--	--	--	--	--	ND [0.166]
Benzo(k)fluoranthene	mg/kg	150 G	--	--	--	--	--	ND [0.166]
Chrysene	mg/kg	1,500 G	--	--	--	--	--	ND [0.166]
Dibenzo(a,h)anthracene	mg/kg	1.5 G	--	--	--	--	--	ND [0.166]
Fluoranthene	mg/kg	5,500 G	--	--	--	--	--	ND [0.166]
Fluorene	mg/kg	5,500 G	--	--	--	--	--	16.9 [3.31]
Indeno(1,2,3-cd)pyrene	mg/kg	15 G	--	--	--	--	--	ND [0.166]
Naphthalene	mg/kg	180 H	--	--	--	--	--	162 [33.1]
Phenanthrene	mg/kg	41000 G	--	--	--	--	--	1.13 [0.166]
Pyrene	mg/kg	4,100 G	--	--	--	--	--	ND [0.166]
Total Solids [A2540G]								
Total Solids	%	na	71.5	88.3	67.8	79.2	88.0	33.5

Key:

-- = analysis not performed on this sample.

bgs = below ground surface.

Cleanup Level = Proposed in August 18, 2003 Memo or Method Two Table B1, Arctic Zone (18AAC75.341) with the following codes specifying the pathway: G = ingestion pathway; H = Inhalation pathway.

E = See Technical Memorandum: Proposed Petroleum Hydrocarbon Soil Cleanup Levels for TAPS Corridor Repeater Sites (August 18, 2003).

J = result is considered an estimate value.

na = no cleanup level applicable for this parameter.

ND = parameter not detected above the method quantitation limit (MQL).

Notes:

Values in brackets are MQLs.

Values in Bold indicate exceedance of the ADEC Cleanup Level.

ATTACHMENT 3
AT&T SITE PHOTOGRAPHS

AT&T SITE PHOTOGRAPHS



Aerial view of Costa Hill Repeater Site, looking south.



Stressed vegetation under Tank 4.

AT&T SITE PHOTOGRAPHS

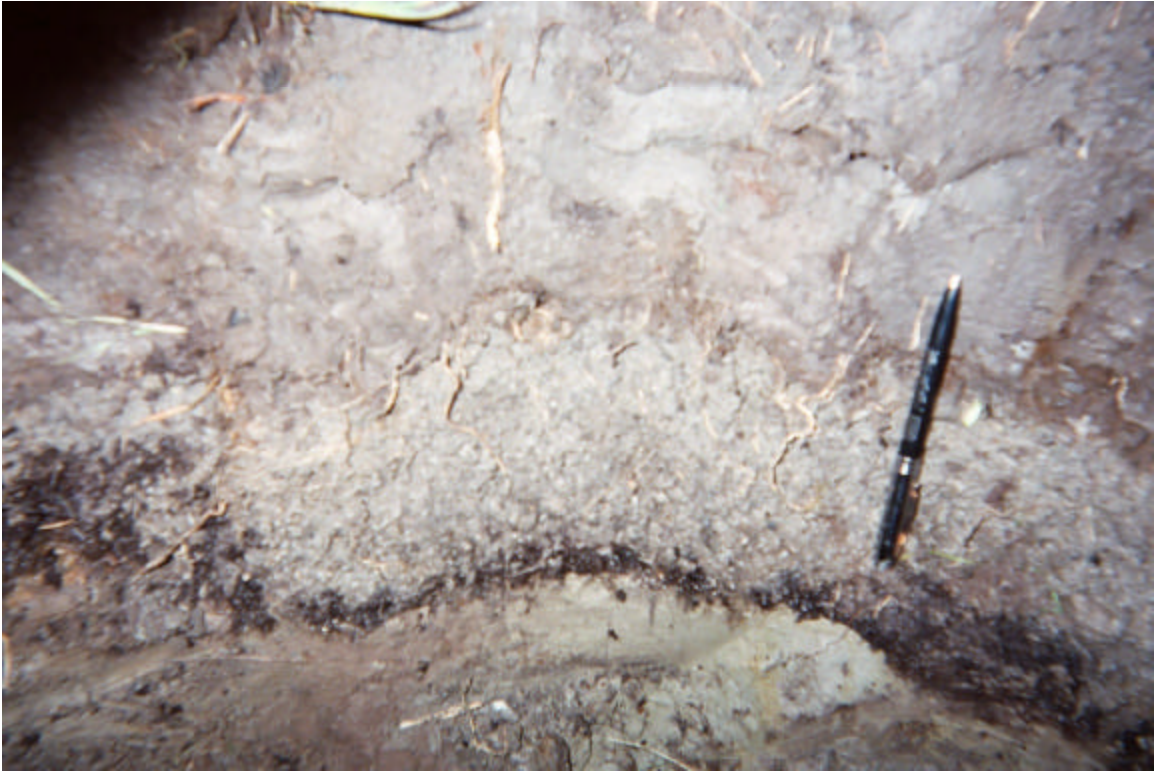


Analytical sample location 047 at fuel bladder staging area.



Excavation at Tank 2 center, note contaminated organic matter.

AT&T SITE PHOTOGRAPHS



Soil horizons: Peat (high organic matter); presumably imported fill, thin dark organics; clay



Sheen on water in excavation beneath Tank 1.

AT&T SITE PHOTOGRAPHS



No sheen on surface water adjacent to Tanks.



Final excavation at generator module.

AT&T SITE PHOTOGRAPHS



Excavation at Tank 1 and Tank 2; note distance to adjacent surface water.



View between tank and water; looking west.

AT&T SITE PHOTOGRAPHS



Generator module excavation in progress. Looking west.



Completed excavation beneath generator module, note liner at base of excavation. Looking west.

AT&T SITE PHOTOGRAPHS



Early stages of excavation beneath AST 3. Looking north.



Finished excavation beneath AST 3, note liner at depth of excavation. Looking north.

AT&T SITE PHOTOGRAPHS



Installing geofabric liner beneath AST 4 and AST 1. Looking north.



Initial layer of native fill material applied at AST 4. Looking north.

AT&T SITE PHOTOGRAPHS



Geofabric liner beneath ASTs 2 and 3, ready for base layer of D-1 fill. Looking southeast.



Applying geofabric liner on top of D-1 fill, preparing to complete backfill with native material. Looking southeast.

AT&T SITE PHOTOGRAPHS



Compacting fill between AST's 3 and 4. Looking north.

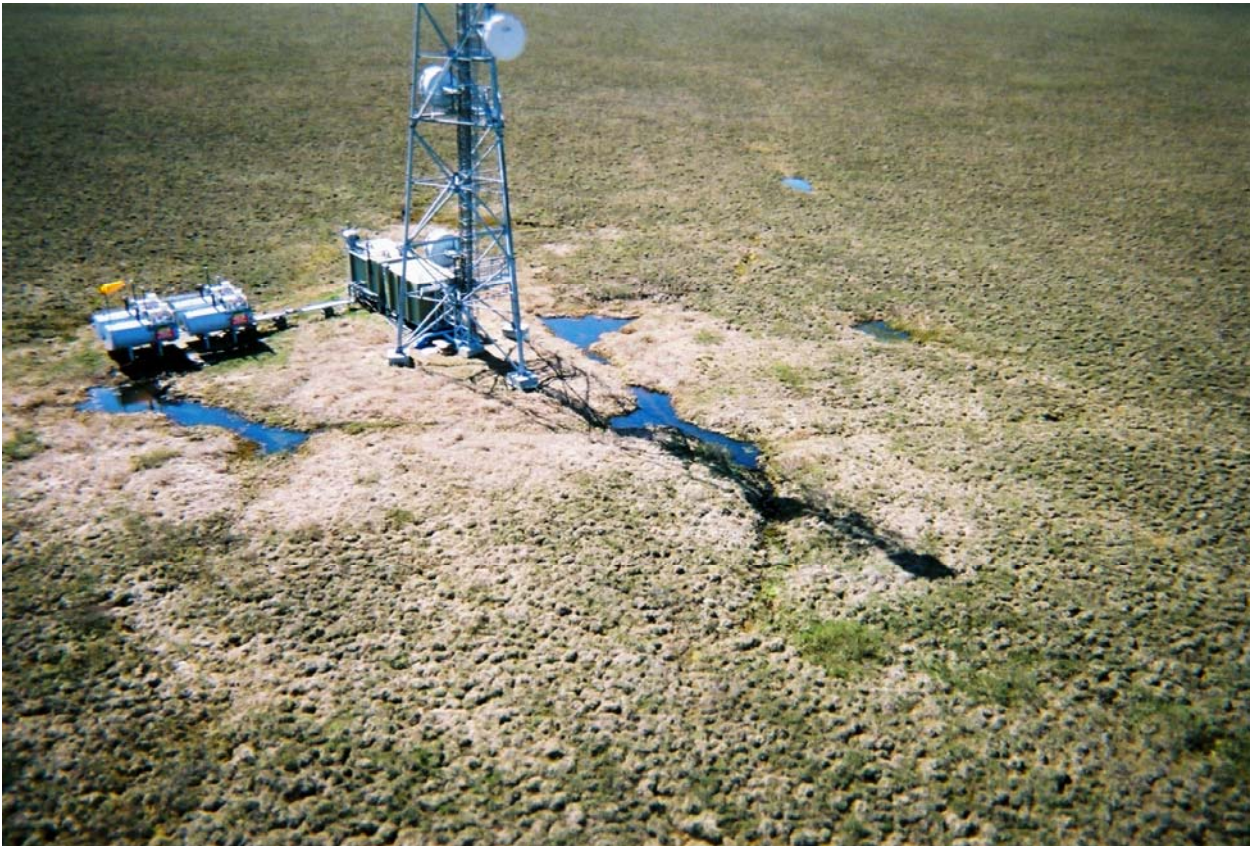


Completed backfill at ASTs with dike of native material between AST 1 and surface water. Looking southwest.

AT&T SITE PHOTOGRAPHS



Aerial Site Photo looking west.



Aerial Site Photo looking south.

AT&T SITE PHOTOGRAPHS



Surface Water pond on the north side of the tanks looking south.



Surface Water pond north of the Communication Tower looking south.

AT&T SITE PHOTOGRAPHS



Sampling at SW01 looking north.



Collecting water quality measurements at SW03 looking north.

AT&T SITE PHOTOGRAPHS



Collecting water quality measurements at SW05 looking south.



Collecting water quality measurements at SW04 looking north.

Costa Hill Repeater



Costa Hill Repeater prior to dewatering activities looking south.



Tundra pond to the west of the tower leg prior to dewatering activities looking northwest.

Costa Hill Repeater



D-1 gravel in place and compacted in the area north west of the tower..



Polystyrene blue board insulation placed on top of the D-1 gravel to provide additional thermal insulation.

Costa Hill Repeater



Spreading tundra material in the northern extent of the depression looking west.



Tundra material backfill complete in the depression looking south.

Costa Hill Repeater



Tundra material fill from 2006 field season with re-vegetation in progress looking south.



Aerial view of Costa Hill Repeater site after all dewatering and backfill activities complete.

ATTACHMENT 4

AT&T REFUELING PROCESS PHOTOGRAPHS

AT&T TAPS REPEATER SITES REFUELING PROCESS PHOTOGRAPHS

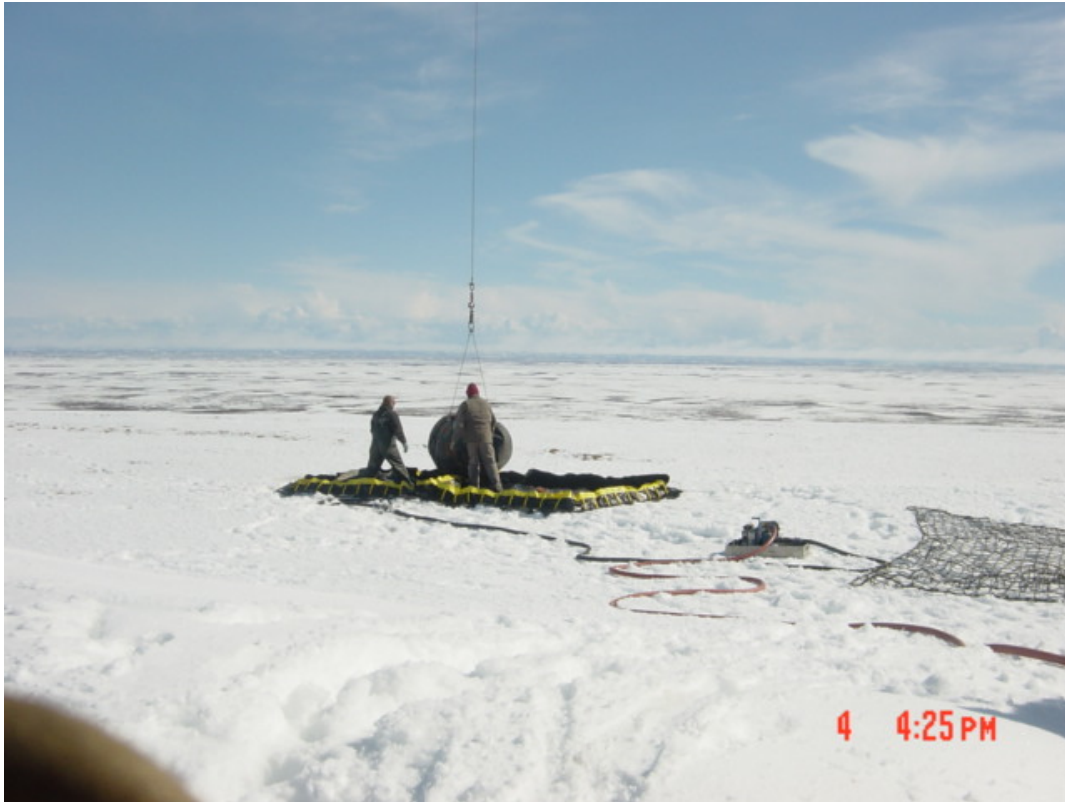


Highway site staging area. Filling fuel bladders within portable secondary containment



Fuel bladder sling load to portable secondary containment system on ground at repeater site.

AT&T TAPS REPEATER SITES REFUELING PROCESS PHOTOGRAPHS



Landing fuel bladder within portable secondary containment system.



Pump fuel from bladder in secondary containment via modular portable pump with secondary containment.