Gas N Go

Closure Report
for
UST Removals
October, 1993

MONTGOMERY WATSON

CLOSURE REPORT
for
UST REMOVALS
at
GAS N GO

October 1993

Prepared for
Hugh Grant
Owner Gas N Go

Prepared by
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TABLE OF CONTENTS

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Introduction

In late August, 1993, Hugh Grant, owner of the Gas N Go gas station, contracted for the removal and disposal of several underground storage tanks (UST) that were located beneath the site of the former Gas N Go complex. Petroleum Services Inc. (PSI) was in charge of cleaning the tanks, pumping and disposing of the sludge, and the actual removal of the tanks. Montgomery Watson Americas, Inc. provided third party environmental engineering services for the UST removals that included a closure site assessment, all necessary laboratory analysis, and a final report.

Background

There were a total of four tanks to be removed from the site. All four tanks were located at the Gas N Go filling station located on Glacier highway. The native backfill was a coarse grained sand gravel mixture with naturally occurring organic matter. The water table at the time of excavation was approximately 10 feet below the surface, with water intrusion occurring at the northeast end of the excavation. The area ground water is affected by tidal fluctuations, and tide elevation during the course of the work ranged from a high of 16 feet to a low of -0.7 feet. There are no known functional wells within one mile of the site, since virtually all residents in the area are connected to the CBJ water system. Figure 1 is a site diagram of the project area.

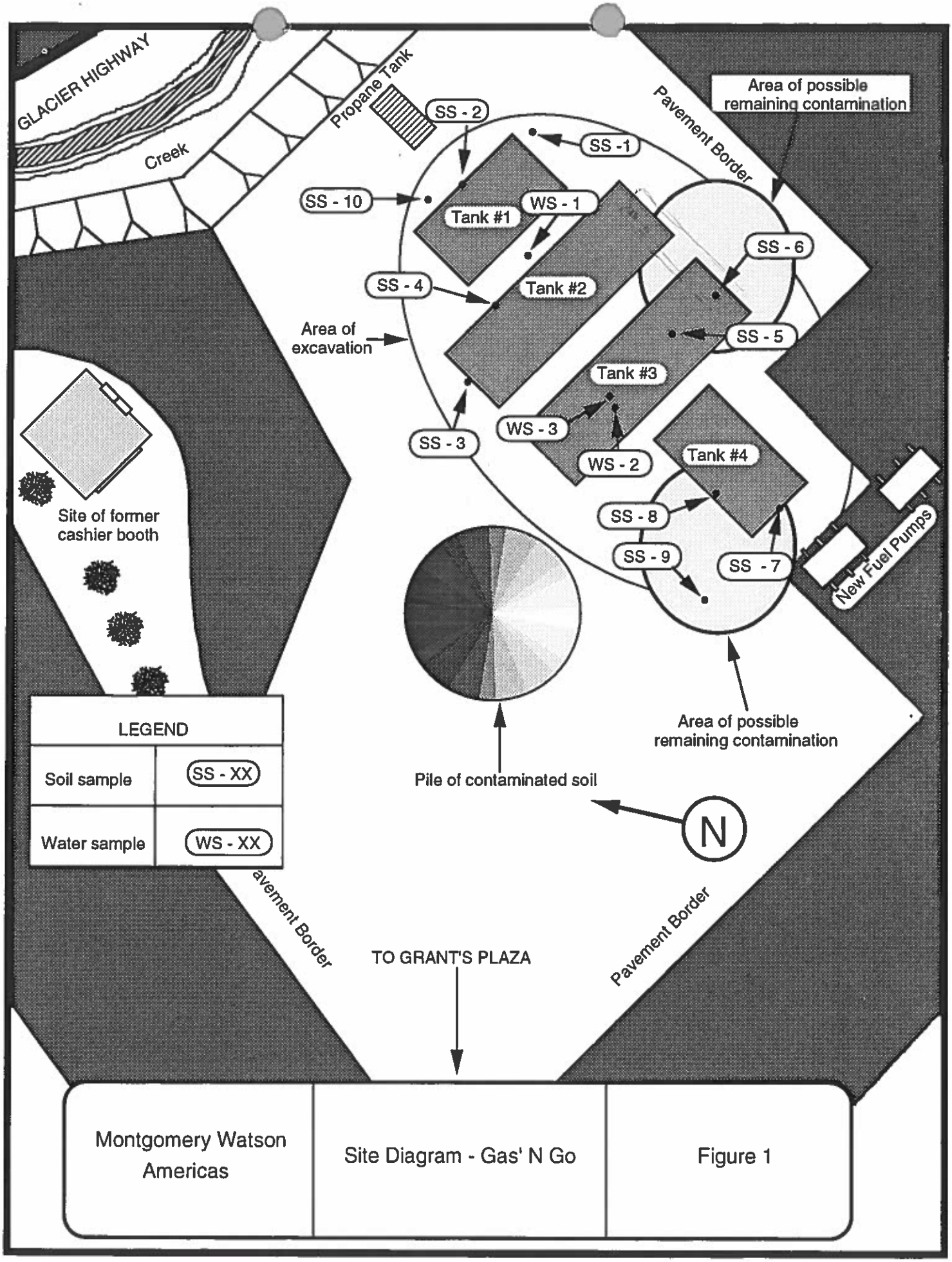
really....?

Tank #1 Removal

DEC ID# 1

Tank #1 is a 5,000 gallon steel gasoline tank, that was originally installed in 1978. It contained unleaded gasoline that was used for fueling private consumer vehicles. Prior to the tank removal, all sludge and remaining fuel in the tank were pumped by PSI, and the tank was removed using a combination of a Koehring excavator and a rubber tired back hoe. The Koehring excavator was used for further excavation of the site. All removal work for Tank #1 occurred before Montgomery Watson field staff arrived on site, but the tank was available for inspection. The tank appeared to be in good condition, with no visible corrosion on the tank exterior. The tank is currently stored behind the Grant's Plaza shopping complex, until an ultimate disposal location can be determined.

After removal of the tank, a pool of water approximately 10-12 inches deep formed in the bottom of the excavation. The water appeared to be emanating from the northeast end of the excavation. The water that accumulated in the excavation was probably a combination of ground water and runoff from the excessive rains encountered during the project.


GLACIER HIGHWAY
Creek
Propane Tank
SS - 2
SS -1
SS - 10
Tank #1
WS - 1
Tank #2
SS - 4
Area of
excavation
SS - 6
SS - 5
Tank #3
WS - 3
WS - 2
SS - 3
Tank #4
SS - 8
SS - 9
SS - 7
Area of possible
remaining contamination
Pavement Border
New Fuel Pumps
Site of former
cashier booth
LEGEND
Soil sample
SS - XX
Water sample
WS - XX
Pile of contaminated soil
Area of possible
remaining contamination
N
avement Border
TO GRANT'S PLAZA
Pavement Border
Montgomery Watson
Americas
Site Diagram - Gas' N Go
Figure 1

Approximately 20 cubic yards (c.y.) of material was removed from the excavation for Tank #1 and stockpiled on the pavement at the west end of the excavation. The entire site had a faint odor of gasoline. Organic vapor screening of samples from the excavation of Tank #1 with the photo ionization detector (PID) showed that readings were above acceptable limits. All of the contaminated material thus identified was taken to an owner-constructed short term storage cell located behind Grant's Plaza. Montgomery Watson field personnel requested that the owner construct the short term storage cell as follows:

- Spread out a layer of visquine with raised edges forming berms.
- Completely cover the contaminated material once it was all placed in the cell.

Montgomery Watson did a follow up inspection of the short term storage cell on October 7, 1993 and recommended to the owner that the contaminated material be completely covered to minimize the production of contaminated runoff.

Based on the initial PID readings, it was determined that additional contamination still had to be removed from the excavation. Excavation did not proceed below a depth of 10 feet however, because ground water was encountered there. Excavation was further hampered by pavement borders to the northwest and to the northeast and a propane tank located to the immediate northeast made excavation impossible beyond that point.

ADEC regulation 18 AAC 78, requires that two soil samples be collected within two feet of the tank bottom, one in the middle and one at either end. Due to the amount of water located in the excavation, it was more difficult to sample exactly by the regulations. Soil sample #1 was collected from the east end of the excavation, and Soil sample #2 was collected from the middle of Tank #1, at the soil/water interface, both at a depth of approximately 10 feet. Water sample #1 was then taken from the south side of Tank #1 (see Figure 1). In accordance with procedures recommended by the contract laboratory, soil samples were collected in glass jars and carefully sealed, and the water sample was extracted into 40mL pre-preserved glass vials and similarly sealed. All samples were then packed with ice into a cooler (to retard volatilization of hydrocarbons) and shipped to the laboratory. The samples were logged in at the analyzing laboratory within one week of field sampling, and were noted as being properly packaged and temperature controlled. Soil samples #1 and #2 were analyzed for Volatile Petroleum Hydrocarbons (VPH), which is the appropriate test to measure gasoline contamination. Water sample #1 was analyzed for BETX (Benzene, Toluene, Ethyl benzene, and Xylenes) which will give a breakdown of the hydrocarbons contained in the water. The results for BETX are reported in µg/L, as opposed to mg/Kg for the soil. Laboratory reports and quality control (QC) backup for the analyses are included as Appendix A, and the results are summarized in Table 1 below.

TABLE 1
LABORATORY RESULTS SUMMARY
TANK #1

Sample ID #	Lab Number	VPH (mg/Kg)	BETX Soil (mg/Kg)	BETX Water (µg/L)
Soil sample #1	GG831-3	320	ND (Non Detect)	N/A
Soil sample #2	GG831-4	5000	ND (B) 100 (E) 37 (T) 500 (X)	N/A
Water sample #1	GG831-A	N/A	N/A	2000 (B) 1600 (E) 13000 (T) 18000 (X)

Tank #2 Removal

Tank #2 is a 10,000 gallon steel tank that was first put into service in 1978. The tank contained unleaded gasoline fuel that was used to fill private consumer vehicles. The tank surface was also in good condition, with no visible breach of the exterior. PSI cleaned the tank and removed it from the ground, using similar procedures to those described above for Tank #1.

Tank #2 was in the process of being removed when Montgomery Watson field staff arrived on site. After the tank was removed from the excavation, water from Tank #1 excavation flowed into the newly made hole from Tank #2, immersing the hole totally in water. Just before Tank #2 excavation began the PID battery failed, so no further field screening was possible. The decision was made to assume contamination in the excavation, and to remove as much material as possible. This assumption was used for all remaining tank removals.

Approximately 10 c.y. of material was excavated from the Tank #2 hole and hauled to the short term storage cell behind Grant's plaza. After the tank was removed, Soil samples #3 and #4 were collected in accordance with ADEC regulation 18 AAC 78 (see Figure 1). Soil sample #3 was collected from the west end of Tank #2 and Soil sample #4 was collected from the middle of Tank #2, at the soil/water interface. Both samples were collected at a depth of approximately 10 feet. In accordance with procedures recommended by the contract laboratory, soil samples were collected in glass jars and carefully sealed. All samples were then packed with ice into a cooler (to retard volatilization of hydrocarbons) and shipped to the laboratory. The samples were logged in at the analyzing laboratory within one week of field sampling, and were noted as being properly packaged and temperature controlled. Soil samples #3 and #4 were analyzed for Volatile Petroleum Hydrocarbons (VPH), which is the appropriate test to measure gasoline contamination. Laboratory reports and QC backup for the analyses are included as Appendix A, and the results are summarized in Table 2 below.

TABLE 2
LABORATORY RESULT SUMMARY
TANK #2

Sample ID # (Figure 1)	Lab #	VPH (mg/Kg)
Soil sample #3	GG31-1	ND (non-detect)
Soil sample #4	GG31-2	4600

Tank #3 Removal

Tank #3 is a 10,000 gallon steel tank that was first put into service in 1978. The tank contained regular leaded gasoline, and was used to fill private consumer vehicles. The tank surface was in good condition, with no visible corrosion on the exterior. PSI cleaned the tank and removed it from the ground, using similar procedures to those described above for Tank #2.

Montgomery Watson field staff were on site during the removal of Tank #3, and as occurred with Tank #2, the water that had collected in the bottom of the previous excavation, extended into the newly formed hole of Tank #3. After the water had collected into the excavation, a brown slick was present on top of the water. Water sample # 2 was collected in the slick to determine if it contained a regulated substance. Approximately 10 c.y. of soil surrounding the excavation of Tank #3 was removed and hauled to the short term storage cell behind Grant's plaza.

After Tank #3 had been removed, a layer of what appeared to be asphalt was encountered in the southwest end of the excavation at a depth of approximately 10 feet. It is possible that this layer of material contributed to the brown slick that formed on the water. Fuel absorbent pads were put on the water in the excavation to help remove some of the brown slick, but this appeared to be only somewhat successful. Water sample #3 was collected to determine if the slick was the result of a diesel influence. Two soil samples were then taken, in accordance with ADEC regulation 18 AAC 78. Soil sample #5 was taken at the middle of the tank, at the soil/water interface, and Soil sample #6 at the east end of the tank, also at the interface.

In accordance with procedures recommended by the contract laboratory, soil samples were collected in glass jars and carefully sealed, and the water sample was extracted into 40mL pre-preserved glass vials and similarly sealed. All samples were then packed with ice into a cooler (to retard volatilization of hydrocarbons) and shipped to the laboratory. The samples were logged in at the analyzing laboratory within one week of field sampling, and were noted as being properly packaged and temperature controlled. Water sample #2 was analyzed for BETX, while Water sample #3 was analyzed for Extractable Petroleum Hydrocarbons (EPH), which is the appropriate test to analyze for diesel. Soil samples #5 and #6 were analyzed for BETX and VPH. Since this tank contained leaded fuel, Soil samples #5 and #6, were additionally analyzed for Lead. Laboratory reports and QC backup for the analyses are included as Appendix A, and the results are summarized in Table 3 below.

TABLE 3
LABORATORY RESULT SUMMARY
TANK #3

Sample ID (Figure 1)	Lab Number	Lead (mg/Kg)	VPH (mg/Kg)	EPH Water (mg/L)	BETX Water (µg/L)	BETX Soil (mg/Kg)
Soil sample #5	GG831-5	3	10000	N/A	N/A	ND (B) 170 (E) 120 (T) 1000 (X)
Soil sample #6	GG831-6	3.9	2100	N/A	N/A	ND (B) 19 (E) ND (T) 190 (X)
Water sample #2	GG831-B	N/A	N/A	N/A	10000 (B) 54000 (E) 8700 (T) 67000 (X)	N/A
Water sample #3	GG831-C	N/A	N/A	100	N/A	N/A

Tank #4 Removal

Tank #4 is a 5,000 gallon steel tank that was first put into service in 1978. This tank contained diesel fuel, and was used to fuel private consumer vehicles. Tank #4 appeared to be in good condition, with no visible breach of the tank exterior. PSI cleaned the tank and removed it from the ground, using similar procedures to those described above for Tank #3.

No Montgomery Watson field staff were present at the site when Tank #4 was removed. Approximately 10 c.y. of soil was removed and stockpiled on the asphalt next to the excavation until it could be hauled to the short term storage cell. After the tank was removed, the water that was in the excavation from the previous three removals, flowed into the newly made hole from Tank #4. As a result, sampling was more difficult because of the amount of water in the bottom of the excavation. Soil sample #7 was collected at the south end of the tank, and Soil sample #8 was collected in the middle at the soil/water interface, (see Figure 1). Both were taken at a depth of 10 feet.

In accordance with procedures recommended by the contract laboratory, soil samples were collected in glass jars and carefully sealed. All samples were then packed with ice into a cooler (to retard volatilization of hydrocarbons) and shipped to the laboratory. The samples were logged in at the analyzing laboratory within one week of field sampling, and were noted as being properly packaged and temperature controlled. Both of the samples were analyzed for EPH, which is the appropriate test to run to analyze for diesel. Laboratory reports and QC backup for the analyses are included as Appendix A, and the results are summarized in Table 4 below.

TABLE 4
LABORATORY RESULT SUMMARY
TANK #4

Sample ID # (Figure 1)	Lab #	EPH (mg/Kg)
Soil sample #7	GG831-7	1200
Soil sample #8	GG831-8	310

Excavated Area

Once all of the tanks had been removed, the entire site was given a thorough visual inspection, and it was noted that contaminated soils remained in the northeast and southwest corners of the excavation. The decision was therefore made to remove as much of the contaminated material from those locations as possible given the site constraints. After this was accomplished, Soil sample #9 was taken at the southwest corner of the excavation at a depth of nine feet, where the assumed layer of asphalt was encountered, to determine if it contained anything that might contaminate the surrounding soil. Soil sample #10 was taken from the northeast corner of the excavation, at a depth of 10 feet, to determine if the remaining material was still contaminated. Soil sample # 9 was analyzed for EPH and Soil sample #10 was analyzed for VPH and BETX. Once these were sampled, the excavation was lined with visquine, and backfilled with clean import material. The visquine was put in place to ensure that the imported material would not be exposed to contamination, and to delineate the excavation in the event that re-excavation might be required at a later date.

Material removal was halted and the excavation filled in because of several mitigating factors. The primary factor in the decision to fill in the excavation was safety. Excavation could not continue to the north-northeast because of the propane tank location and the pavement border. Excavation could go no further down because of ground water at a depth of approximately 10 feet. The pavement border to the north-northwest prevents any further excavation in that direction.

Approximately 8 c.y. of contaminated material removed from the excavation was stockpiled temporarily on the asphalt next to the site until it could be transported to the short term storage cell behind Grant's plaza.

Table 5 summarizes the lab results for all samples collected during the Gas N Go UST removal project. Laboratory reports and QC backup for Soil samples #9 and #10 are included as Appendix A. Also included in the table is the cleanup level established by the matrix level score sheet for the site for each of the analyses performed. The matrix level score sheet is included as Appendix B of this report.

TABLE 5
OVERALL LABORATORY RESULT SUMMARY
GAS N GO UST REMOVAL PROJECT

Tank #	Sample ID # (Fig. 1)	Lab #	Lead (mg/Kg)	VPH Soil (mg/Kg)	EPH Soil (mg/Kg)	BETX Soil (mg/Kg)	BETX Water (µg/L) ppb
1	Soil sample #1	GG831-3	N/A	320	N/A	ND	N/A
1	Soil sample #2	GG831-4	N/A	5000	N/A	ND (B) 100 (E) 37 (T) 500 (X)	N/A
2	Soil sample #3	GG831-1	N/A	ND	N/A	ND (B) 27 (E) ND (T) 96 (X)	N/A
2	Soil sample #4	GG831-2	N/A	4600	N/A	ND (B) 63 (E) 17 (T) 480 (X)	N/A
3	Soil sample #5	GG831-5	3.0 ✓	10000	N/A	ND (B) 170 (E) 120 (T) 1000 (X)	N/A
3	Soil sample #6	GG831-6	3.9 ✓	2100	N/A	ND (B) 19 (E) ND (T) 190 (X)	N/A
4	Soil sample #7	GG831-7	N/A	N/A	1200	N/A	N/A
4	Soil sample #8	GG831-8	N/A	N/A	310	N/A	N/A
N/A	Soil sample #9	GG831-9	N/A	N/A	1500	N/A	N/A
N/A	Soil sample #10	GG831-10	N/A	ND	N/A	ND (B) ND (E) ND (T) ND (X)	N/A
Between 1 & 2	Water sample #1	GG831-A	N/A	N/A	N/A	N/A	2000 (B) 13000 (E) 1600 (T) 18000(X)
3	Water sample #2	GG831-B	N/A	N/A	N/A	N/A	10000 (B) 54000 (E) 8700 (T) 67000(X)
3	Water sample #3	GG831-C	N/A	N/A	100 water (mg/L)	N/A	N/A
Clean up level			**15**	**100**	**200**	**15**	**15**

Table C benzene limit 5ppb

Conclusions

A site assessment of the UST excavation was performed in accordance with ADEC regulation 18 AAC 78.090. All samples were collected in the appropriate manner, and investigation of the site was accomplished. Laboratory analysis of the samples showed there had been a release into the soil surrounding the UST's, so in accordance with regulation 18 AAC 78.220, a release notification letter was composed and sent to ADEC. A copy of the release notification letter is found in Appendix C of this report.

Based on the lab results, the areas of highest contamination appear to be Soil samples # 2, and #4 through #9. After discussion with the owner, it was learned that the fill pipes for the tanks where located towards the eastern part of the excavation for Tank #2 and Tank #3, and towards the south west end for Tank #4. The possibility therefore exists that the release came from the filling pipes to the tanks, and this may explain why such heavy contamination is found at these locations. It appears that the contamination initially found in the area of Tank #1 has been removed, since the last sample removed from that area, Soil sample #10, had a result of ND for VPH and BETX, compared to the higher levels encountered with the first samples, Soil samples #1 and #2. Since excavation around Tank #4 was halted, contamination may still be present there as evidenced by Soil samples #7 through #9. The same may be true for the east end of Tank #3 since excavation could not continue in this area either, as evidenced by Soil samples #5 and #6. Three total water samples were taken for the site. Water samples #1 and #2 were sampled for BETX, to attempt to determine the general makeup of hydrocarbons, if any, in the water. Water sample #3 was sampled for EPH to try to determine if the slick encountered on the water of the excavation was caused by diesel. The slick did have some diesel in it, but it was within the cleanup level for the site, and therefore is not a problem. Based on the laboratory results for Water samples #1 and #2, it appears that some contamination from the soil may have affected the water found in the excavation.

Since all of the tank exteriors were in good condition upon removal, a release from the tank may not be the cause of the contamination. Rather, contamination may have resulted from chronic overflowing of the fill pipes during the period of time that the tanks were in service. The laboratory results indicate that the areas of greatest contamination occur in those locations where the tank fill pipes were located. This suggests that the fill pipes may indeed be the cause for release of a regulated substance into the soil.

Since there is contamination still present in the site, the following additional action on the owner's part is required:

1) Under ADEC regulation 18 AAC 78.230, a site release investigation must be performed within 30 days of receiving this site assessment report. A release investigation entails gathering certain information about the site, which includes the following:

    - Time and knowledge of release.
    - Who was notified and when notification occurred.
    - How the release was identified.

   The following additional soil information must also be provided:

    - In the event of ground water contamination, a boring of the backfill area of the UST, in the zone of seasonal water fluctuation.

- Soil log with the boring or test pit numbers, with the locations of each boring, including the legal description of each.

ADEC may grant a 14 day extension to the 30 day deadline, if the agency feels such action is warranted.

2) If the site release investigation report indicates that the water quality criteria established in ADEC regulations 18 AAC 70, or the applicable cleanup levels at 18 AAC 78 for soil have been exceeded, indicating that a release has occurred, then corrective action is required under 18 AAC 78.240. Within 60 days of the confirmation of a release, a corrective action report must be submitted, unless ADEC directs otherwise. A corrective action report must to include the following information:

   - Clean up actions required by ADEC regulations 18 AAC 78.
   - Preliminary risk evaluation form, which summarizes data on the surrounding populations, water quality, use and locations of wells, and other items that may be impacted from a release.
   - Data on the release and the estimated amount of the regulated substance.

   Once the corrective action report is submitted to ADEC, the agency will determine what further action, if any, is required.

Montgomery Watson can assist the owner in complying with the requirements listed above if the need arises.

Appendix A

LABORATORY REPORTS AND QUALITY CONTROL (QC) BACKUP

ANALYTICA
INCORPORATED

18000 W. Highway 7
Golden, CO 80403-829
(303) 420-44
(800) 373-87
FAX (303) 420-14

Montgomery Laboratories
5438 Shaune Drive
Juneau, AK 99801

Attn: Mr. Gallagher

Order #: 93-09-021
Date: 09/17/93
Work ID: Hugh Grant/Gas "N" Co
Date Received: 09/07/93
Date Completed: 09/17/93

FAX RESULTS (907)780-6670

SAMPLE IDENTIFICATION

Sample Number	Client Description
01	GG831-1
02	GG831-2
03	GG831-3
04	GG831-4
05	GG831-5
06	GG831-6
07	GG831-7
08	GG831-8
09	GG831-9
10	GG831-10
11	GG831-A
12	GG831-B
13	GG831-C

Enclosed are the analytical results for the submitted samples. All analyses met quality assurance objectives except where noted in the case narrative. If you have any questions regarding the analyses, please feel free to call.

Doyce T. Blair
Laboratory Director

Samples were prepared and analyzed according to methods outlined in the following references:

- Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 1, November 1990.

Problems encountered with the analyses are discussed in the following narrative.

The surrogate for the EPH_W on 9309021-13A was diluted out in order to bring the sample hit into linear range. The chromatography pattern is that of volatiles lighter than diesel.

Samples 9309021-07 and -09 had the the surrogate diluted out due to high levels of target analyte for the EPH_S analysis.

The gasoline levels of 9309021-03 for VPH_S prevented a more concentrated analysis for BTEX_S.

The BTEX_S analysis of sample 9309021-10 had low surrogate recoveries due to matrix effects. This was confirmed by reanalysis.

BTEX_S: BTEX (GCPID) METHOD: 8020

BTEX_W: BTEX (GCPID) METHOD: 8020

VPH_S: VOLATILE PETROLEUM HYDROCARBONS METHOD: mod 8015
Analysis of volatile gasoline components. 5 grams of sample are sparged per method 5030A and analyzed by GC-FID using chromatographic conditions outlined in method 8015. The sample is quantitated against known concentrations of gasoline standards.

EPH_S EXTRACTABLE PETROLEUM HYDROCARBONS METHOD: mod 8100
Analysis of extractable diesel range organics. 30 grams of sample are extracted per method 3550 and analyzed by GC-FID using chromatographic conditions outlined in method 8100. The sample is quantitated against known concentrations of diesel standards.

EPH_W EXTRACTABLE PETROLEUM HYDROCARBONS METHOD: mod 8100
Analysis of extractable diesel range organics. 1 liter of sample is extracted per method 3510 or 3520 and analyzed by GC-FID using chromatographic conditions outlined in method 8100. The sample is quantitated against known concentrations of diesel standards.

PB_GTS: LEAD, Total (GFAA) METHOD: 3050/7421

PMOIST: PERCENT MOISTURE METHOD: ASTM D2216

Sample: 01A GG831-1 Collected: 08/30/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Toluene	EPA 8020	27000	10000	ug/Kg		09/09/93
Ethylbenzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Xylenes, Total	EPA 8020	96000	20000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		107	Min:	70	Max:	130
VOLATILE PET HYDROCARBONS	EPA 8015M					
VPH	EPA 8015M	ND	1000000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		81.3	Min:	50	Max:	150
p-Bromofluorobenzene		105	Min:	50	Max:	150

Sample: 02A GG831-2 Collected: 08/30/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Toluene	EPA 8020	63000	10000	ug/Kg		09/09/93
Ethylbenzene	EPA 8020	17000	10000	ug/Kg		09/09/93
Xylenes, Total	EPA 8020	480000	20000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		106	Min:	70	Max:	130
VOLATILE PET HYDROCARBONS	EPA 8015M					
VPH	EPA 8015M	4600000	1000000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		89.3	Min:	50	Max:	150
p-Bromofluorobenzene		97.7	Min:	50	Max:	150

Sample: 03A GG831-3 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	1000	ug/Kg		09/10/93
Toluene	EPA 8020	ND	1000	ug/Kg		09/10/93
Ethylbenzene	EPA 8020	ND	1000	ug/Kg		09/10/93
Xylenes, Total	EPA 8020	ND	2000	ug/Kg		09/10/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		99.0	Min:	70	Max:	130
VOLATILE PET HYDROCARBONS	EPA 8015M					
VPH	EPA 8015M	320000	100000	ug/Kg		09/10/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		85.3	Min:	50	Max:	150
p-Bromofluorobenzene		108	Min:	50	Max:	150

Sample: 04A GG831-4 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Toluene	EPA 8020	100000	10000	ug/Kg		09/09/93
Ethylbenzene	EPA 8020	37000	10000	ug/Kg		09/09/93
Xylenes, Total	EPA 8020	500000	20000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		104	Min:	70	Max:	130
VOLATILE PET HYDROCARBONS	EPA 8015M					
VPH	EPA 8015M	5000000	1000000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		92.7	Min:	50	Max:	150
p-Bromofluorobenzene		104	Min:	50	Max:	150

Sample: 05A GG831-5 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Toluene	EPA 8020	170000	10000	ug/Kg		09/09/93
Ethylbenzene	EPA 8020	120000	10000	ug/Kg		09/09/93
Xylenes, Total	EPA 8020	1000000	20000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		101	Min:	70	Max:	130
LEAD, Total	SW 3050/7421	3.0	0.10	mg/Kg		09/14/93
PERCENT MOISTURE	ASTM D2216	21.2	0.1	WT%		09/09/93
VOLATILE PET HYDROCARBONS	EPA 8015M					
VPH	EPA 8015M	10000000	1000000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		94.0	Min:	50	Max:	150
p-Bromofluorobenzene		94.0	Min:	50	Max:	150

Sample: 06A GG831-6 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units		Analyzed
BTEX	EPA 8020					
Benzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Toluene	EPA 8020	19000	10000	ug/Kg		09/09/93
Ethylbenzene	EPA 8020	ND	10000	ug/Kg		09/09/93
Xylenes, Total	EPA 8020	190000	20000	ug/Kg		09/09/93
Surrogates, % Recovery						
α,α,α-Trifluorotoluene		101	Min:	70	Max:	130
LEAD, Total	SW 3050/7421	3.9	0.10	mg/Kg		09/14/93
PERCENT MOISTURE	ASTM D2216	19.1	0.1	WT%		09/09/93

Sample: 06A GG831-6 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units	Analyzed
VOLATILE PET HYDROCARBONS	EPA 8015M				
VPH	EPA 8015M	2100000	1000000	ug/Kg	09/09/93
Surrogates, % Recovery					
α,α,α-Trifluorotoluene		84.7	Min: 50	Max: 150	
p-Bromofluorobenzene		102	Min: 50	Max: 150	

Sample: 07A GG831-7 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units	Analyzed
EXT PETROLEUM HYDROCARBONS	EPA 8100M				
EPH	EPA 8100M	1200	100	mg/Kg	09/14/93
Surrogates, % Recovery					
o-Terphenyl		0	Min: 50	Max: 150	

Sample: 08A GG831-8 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units	Analyzed
EXT PETROLEUM HYDROCARBONS	EPA 8100M				
EPH	EPA 8100M	310	10	mg/Kg	09/09/93
Surrogates, % Recovery					
o-Terphenyl		103	Min: 50	Max: 150	

Sample: 09A GG831-9 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units	Analyzed
EXT PETROLEUM HYDROCARBONS	EPA 8100M				
EPH	EPA 8100M	1500	100	mg/Kg	09/14/93
Surrogates, % Recovery					
o-Terphenyl		0	Min: 50	Max: 150	

Sample: 10A GG831-10 Collected: 08/31/93 Matrix: SOIL

Test Description	Method	Result	Limit	Units	Analyzed
BTEX	EPA 8020				
Benzene	EPA 8020	ND	1.0	ug/Kg	09/10/93
Toluene	EPA 8020	ND	1.0	ug/Kg	09/10/93
Ethylbenzene	EPA 8020	ND	1.0	ug/Kg	09/10/93
Xylenes, Total	EPA 8020	ND	2.0	ug/Kg	09/10/93
Surrogates, % Recovery					
α,α,α-Trifluorotoluene		28.7	Min: 70	Max: 130	
VOLATILE PET HYDROCARBONS	EPA 8015M				
VPH	EPA 8015M	ND	100	ug/Kg	09/10/93
Surrogates, % Recovery					
α,α,α-Trifluorotoluene		21.3	Min: 50	Max: 150	
p-Bromofluorobenzene		65.7	Min: 50	Max: 150	

Sample: **11A GG831-A** Collected: **08/31/93** Matrix: **WATER**

Test Description	Method	Result	Limit	Units	Analyzed
BTEX	EPA 8020				
Benzene	EPA 8020	2000	1000	ug/L	09/09/93
Toluene	EPA 8020	13000	1000	ug/L	09/09/93
Ethylbenzene	EPA 8020	1600	1000	ug/L	09/09/93
Xylenes, Total	EPA 8020	18000	2000	ug/L	09/09/93
Surrogates, % Recovery					
α,α,α-Trifluorotoluene		94	Min: 80		Max: 120

Sample: **12A GG831-B** Collected: **08/31/93** Matrix: **WATER**

Test Description	Method	Result	Limit	Units	Analyzed
BTEX	EPA 8020				
Benzene	EPA 8020	10000	1000	ug/L	09/09/93
Toluene	EPA 8020	54000	1000	ug/L	09/09/93
Ethylbenzene	EPA 8020	8700	1000	ug/L	09/09/93
Xylenes, Total	EPA 8020	67000	2000	ug/L	09/09/93
Surrogates, % Recovery					
α,α,α-Trifluorotoluene		107	Min: 80		Max: 120

Sample: **13A GG831-C** Collected: **08/31/93** Matrix: **WATER**

Test Description	Method	Result	Limit	Units	Analyzed
EXT PETROLEUM HYDROCARBONS	EPA 8100M				
EPH	EPA 8100M	100	5.6	mg/L	09/08/93
Surrogates, % Recovery					
o-Terphenyl		0	Min: 60		Max: 140

SPIKE

Seq.	Sample ID	Test Code	Class/ Sub/Dup	Matrix/ Sub	Ref Seq	Spk Seq	Dilution	Weight	Volume	Conv. Factor	Flag	Ver
2	MBS	BTEX_S	K B	S	1		1.0	1.0	1.0	1.0		GJT

Analytes	Result	Unspiked Result	Detection Limit	Spike Value	Rec-overy	Specs Low	Specs High	V
Benzene	19.0	ND	1.0	20.0	95.0	70	130	Y
Toluene	19.0	ND	1.0	20.0	95.0	70	130	Y
α,α,α-Trifluorotoluene	31.1	32.9		30	104	70	130	Y

SPIKE

Seq.	Sample ID	Test Code	Class/ Sub/Dup	Matrix/ Sub	Ref Seq	Spk Seq	Dilution	Weight	Volume	Conv. Factor	Flag	Ver
30	MBS9-025,28	EPH_S	K B	S	29		1.0	1.0	1.0	1.0		GJT

Analytes	Result	Unspiked Result	Detection Limit	Spike Value	Rec-overy	Specs Low	Specs High	V
EPH	502	0	10	500	100	50	140	Y
o-Terphenyl	198.0	166.0	1.0	200	99.0	50	150	Y

SPIKE

Seq.	Sample ID	Test Code	Class/ Sub/Dup	Matrix/ Sub	Ref Seq	Spk Seq	Dilution	Weight	Volume	Conv. Factor	Flag	Ver
13	MBS 9021	EPH_W	K B	W	12		1.0	1.0	1.0	1.0		GJT

Analytes	Result	Unspiked Result	Detection Limit	Spike Value	Rec-overy	Specs Low	Specs High	V
EPH	25.7	ND	0.5	25.0	103	60	130	Y
o-Terphenyl	226.0	200.0	1.0	200.0	113	60	140	Y

SPIKE

Seq.	Sample ID	Test Code	Class/ Sub/Dup	Matrix/ Sub	Ref Seq	Spk Seq	Dilution	Weight	Volume	Conv. Factor	Flag	Ver
25	MBS	PB_GTW	K B	W	24		1.0	1.0	1.0	1.0		KKO

Analytes	Result	Unspiked Result	Detection Limit	Spike Value	Rec-overy	Specs Low	Specs High	V
LEAD, Total	0.039	ND	0.001	0.040	97.5	80	120	Y

Appendix B

MATRIX LEVEL SCORE SHEET

TABLE 5 - MATRIX SCORE SHEET

1. Depth to Subsurface Water		
< 5 feet	(10)	
5 - 15 feet	(8)	
15 - 25 feet	(6)	
25 - 50 feet	(4)	8
> 50 feet	(1)	
2. Mean Annual Precipitation		
> 40 inches	(10)	
25 - 40 inches	(5)	
15 - 25 inches	(3)	10
< 15 inches	(1)	
3. Soil Type (Unified Soil Classification)		
Clean, coarse-grained soils	(10)	
Coarse-grained soils with fines	(8)	
Fine-grained soils (low OC)	(3)	1
Fine-grained soils (high OC)	(1)	
4. Potential Receptors		
Public Well within 1000 feet, or		
Private Well(s) within 500 feet	(15)	
Municipal/priv well w/i 1/2 mi	(12)	
Municipal/priv well w/i 1 mile	(8)	6
No known well within 1/2 mile	(6)	
No known well within 1 mile	(4)	
Non-potable groundwater	(1)	
5. Volume of Contaminated Soil		
> 500 cubic yards	(10)	
100 - 500 cubic yards	(8)	
25 - 100 cubic yards	(5)	5
>De Minimis - 25 cubic yards	(2)	
De Minimis	(0)	

30

Matrix Score		Cleanup Level in mg/kg			
		Diesel	Gasoline/Unknown		
		diesel range petroleum hydrocarbons	gasoline range petroleum hydrocarbons	Benzene	BETX
Level A	>40	100	50	0.1	10
Level B	27-40	200	100	0.5	15
Level C	21-26	1000	500	0.5	50
Level D	<20	2000	1000	0.5	100

Appendix C

RELEASE NOTIFICATION LETTER

Quality
Environmental
Analysis

Montgomery Laboratories

2229.0280

October 4, 1993

Randy Rice
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska

Dear Mr. Rice

This letter is sent on behalf of Hugh Grant, owner of the Gas N Go filling station. On August 30, 1993 Mr. Grant contracted Montgomery Watson Americas, Inc. to provide third party environmental work for the removal of four underground storage tanks (UST) from his filling station located on Glacier Highway.

After receiving the results from the samples we took on site, the lab results showed that there had been a release of a regulated substance into the soil. As required by ADEC regulation 18 AAC 78.220, Release Notification and Response, this letter serves as official notification of that release. Our final report for the removal of the USTs at the Gas N Go complex is currently in progress, and final recommendations will be included in that report.

If you have any questions or require additional information, please feel free to call me at the lab.

Sincerely

John Gallagher
Projects Supervisor

cc Hugh Grant (Gas N Go)