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GORE-SORBER® Exploration Survey
FINAL REPORT

GRANDVIEW HILLS PROSPECT
NORTHWEST TERRITORIES, CANADA

Gore Production Order No. 10754443

21 DECEMBER, 2001

Prepared For:
VINTAGE PETROLEUM, INC.
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Tulsa, OK 74119

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GORE-SORBER® EXPLORATION SURVEY
GORE-SORBER® SCREENING SURVEY

REPORT of FINDINGS
GORE-SORBER® Exploration Survey

Located In:

GRANDVIEW HILLS PROSPECT
NORTHWEST TERRITORIES
CANADA

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Conducted For:

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EXECUTIVE SUMMARY

W. L. GORE & ASSOCIATES, INC. (GORE) has completed a GORE-SORBER® Exploration Survey for VINTAGE PETROLEUM, INC. (VINTAGE), using the GORE-SORBER® Module passive soil gas collector. This surface geochemical survey was conducted over portions of the Grandview Hills Prospect, Northwest Territories, Canada.

The GORE-SORBER Exploration Survey is an advanced surface geochemical prospecting tool capable of detecting and quantifying many organic compounds in the C_2 (ethane) to C_{20} (phytane) range. This technology has evolved from over fifteen years of experience in soil gas geochemical exploration and analytical chemistry. For a general description of this surface geochemical exploration technique, refer to Appendix B, "GORE-SORBER Exploration Survey Surface Geochemical Sampling System".

The objective of this surface geochemical survey was to evaluate portions the Grandview Hills Prospect for potential thermogenic hydrocarbon charge. One producing gas well was included for surface geochemical sampling west of the survey area and one dry hole was included in the eastern portion of the survey area, for geochemical modeling purposes.

GORE-SORBER Modules were placed in a linear pattern over the survey area, with samples placed approximately 1,000 meters apart but dependent on access by helicopter. Approximately 200 line kilometers were covered with geochemical samplers in the conduct of this survey. The geochemical survey sample plan was designed to provide suitable data to address the survey objective discussed in the previous section. This sample spacing was evaluated as adequate to resolve configuration of subsurface hydrocarbon charge similar to gas, and was created by VINTAGE in cooperation with GORE.

A total of one hundred ninety-six (196) grid samples were placed in the ground for this survey ('field samples'), and then returned for laboratory analysis. In addition, thirty (30) samples were used for geochemical modeling purposes ('model samples'), and were placed in gas production and background areas. A reconciliation of field samplers is provided in Appendix C, "Field Documentation and Survey Sample Information". This information shows the status of each sampler sent to the survey area, including all trip blank samples.

The geochemical samplers of this survey remained in place for an average of approximately 19 days, an appropriate exposure time given the difficult terrain of the survey area. Installation of field samples was conducted during the time period between 25 July and 29 July 2001. Retrieval of samples was done from 14 August to 17 August 2001.

The overall condition of survey samplers was evaluated as good, and GORE was able to proceed with analysis and interpretation of the survey samples. All samples were analyzed on GC/MS instruments in the GORE laboratory in Elkton, Maryland, USA. Analysis of all samples for this project proceeded without difficulty.

Laboratory analysis of the samplers was performed for an ultimate yield of 78 organic compounds, according to procedures and methods developed by GORE specifically for use with GORE-SORBER Exploration Surveys. These procedures and methods are discussed in Appendix B, "GORE-SORBER Exploration Survey, Surface Geochemical Sampling System".

Geochemical Model 10.1 was developed to characterize gas emanation in the survey area, using samplers placed near the Model West well site. Geochemical background was modeled from samplers placed near the Model East dry well site. It should be understood that this model represents the surface character of gas emanation near the productive well site.

This model shows small one and two point geochemical features throughout the survey area. In a general sense, the western portion and southeastern portion of the survey area is somewhat more anomalous than the other areas.

The ultimate significance of any geochemical observations and features noted for the Grandview Hills Prospect with respect to regional geological or structural trends is not fully known by GORE at this time. Realistic appraisal of prospectivity will require further rigorous geological interpretation by VINTAGE, in order to select the best areas for further exploration.

1.0 INTRODUCTION

W. L. GORE & ASSOCIATES, INC (GORE) has completed a GORE-SORBER® Exploration Survey for VINTAGE PETROLEUM, INC. (VINTAGE), using the GORE-SORBER® Module passive soil gas collector. This surface geochemical survey was conducted over portions of three Blocks in the Grandview Hills Prospect, Northwest Territories, Canada

The GORE-SORBER Exploration Survey is an advanced surface geochemical prospecting tool capable of detecting and quantifying many organic compounds in the C_2 (ethane) to C_{20} (phytane) range. This technology has evolved from over fifteen years of experience in soil gas geochemical exploration and analytical chemistry. For a general description of this surface geochemical exploration technique, refer to Appendix B, "GORE-SORBER Exploration Survey Surface Geochemical Sampling System".

The GORE-SORBER Exploration Survey provides direct detection data for petroleum (thermogenic) compounds. When properly integrated with other exploration information (seismic time-depth maps, petroleum system data, geological and petrophysical interpretations), the GORE-SORBER Exploration Survey can assist in the reduction of exploration risk.

This report consists primarily of the results of a statistical analysis of the GORE-SORBER Exploration Survey data. It is intended that VINTAGE integrate the results of this geochemical survey with other exploration data, in order to more rigorously evaluate petroleum prospectivity for the Grandview Hills Prospect.

2.0 GEOCHEMICAL SURVEY OBJECTIVES

The objective of this surface geochemical survey was to evaluate portions the Grandview Hills Prospect in the Northwest Territories, Canada, for potential thermogenic hydrocarbon charge.

To complete this geochemical survey and achieve the survey objective, the following tasks were performed:

1. *Field sample acquisition* using GORE-SORBER Module passive soil gas collectors. Modules were spaced approximately 1000 meters apart (depending on access), in the soil to a depth of approximately 50 to 60 centimeters, and were left in place for a period of approximately 19 days, prior to retrieval.

2. *Model sample acquisition* using GORE-SORBER Module passive soil gas collectors. Model samples were placed at selected gas production and background sites, again at a depth of approximately 50 to 60 centimeters. These samples were left in place for a period of approximately 19 days, and subsequently retrieved.

3. *Laboratory analysis using gas chromatography and mass selective detection (GC/MS)*, of all field samples, geochemical model samples, and quality assurance and quality control samples

4. *Statistical processing and evaluation of the survey data*, to identify geochemical patterns in the data set. Discriminant Analysis (DA) is used to compare all survey sample analytical results to the signatures of geochemical models. This process yields a probability value (expressed as a percentage), indicating whether a given field sample is similar to the selected "petroliferous" samples of the model (a high percentage value), or similar to the character of background and/or dry well sites (a low percentage value).

Information pertaining to grid sample and model sample sites is provided in Section 3.0, "Survey Design and Field Operations". For more information on the concepts and process of geochemical modeling and the use of discriminant analysis with this geochemical data, refer to Section 5.0, "Geochemical Modeling", and Appendix B, "GORE-SORBER Exploration Survey Surface Geochemical Sampling System".

3.0 SURVEY DESIGN AND FIELD OPERATIONS

The geochemical survey was conducted over portions of the Grandview Hills Prospect in the Northwest Territories, Canada. One producing gas well was included for surface geochemical sampling west of the survey area and one dry hole was included in the eastern portion of the survey area for geochemical modeling purposes.

GORE-SORBER Modules were placed in a linear pattern over the survey area, with samples placed approximately 1,000 meters apart but dependent on access by helicopter. . Approximately 200 line kilometers were covered with geochemical samplers in the conduct of this survey. The geochemical survey sample plan was designed to provide suitable data to address the survey objective discussed in the previous section. This sample spacing was evaluated as adequate to resolve configuration of subsurface hydrocarbon charge similar to gas, and was created by VINTAGE in cooperation with GORE.

A total of one hundred ninety-six (196) grid samples were placed in the ground for this survey ('field samples'), and then returned for laboratory analysis. In addition, thirty (30) samples were used for geochemical modeling purposes ('model samples'), and were placed in gas production and background areas. A reconciliation of field samplers is provided in Appendix C, "Field Documentation and Survey Sample Information".

Model well site selection forms the foundation of the geochemical modeling process, defining and differentiating the signature of interest (gas) from geochemical background emanation. For the geochemical modeling process to be successful, the selected model well sites must represent appropriately the geochemical influence(s) identified by survey objectives. Model well sites and presumed geochemical influences, with other relevant comments are summarized in Table 1 below. These model well sites were determined by VINTAGE, in consultation with GORE.

All field operations were managed by PEREGRINE VENTURES, of Boulder, Colorado, in the United States of America. PEREGRINE VENTURES was under contract to VINTAGE to provide all field services for this geochemical program. The serial number of the GORE-SORBER Module was recorded for each sample location; positions were determined using handheld Global Positioning System (GPS) receivers operating in standalone mode. Coordinates were recorded in meters relative to Universal Transverse Mercator Zone 8 and 9, NAD27. A report of field activities and sampler coordinates, submitted by PEREGRINE VENTURES, is provided in Appendix C, "Field Documentation and Survey Sample Information". Sample locations are also included in Appendix A, "Geochemical Model Probability Values".

The geochemical samplers of this survey remained in place for an average of approximately 19 days, an appropriate exposure time given the difficult terrain of the survey area. Installation of field samples was conducted during the time period between 25 July and 29 July 2001. Retrieval of samples was done from 14 August to 17 August 2001.

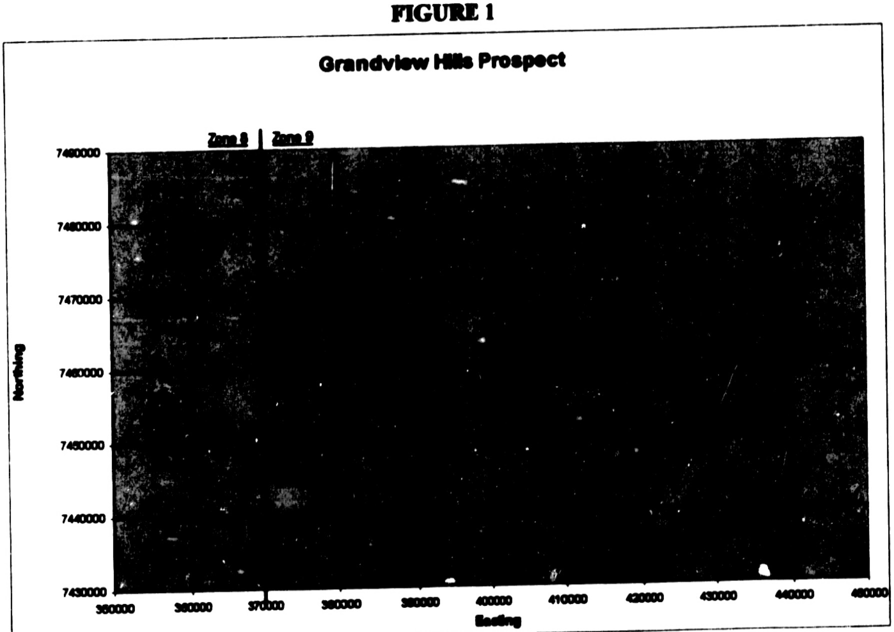
Table 1: Model Well Site Information*

Well Site	Easting†	Northing†	Geochemical Influence
Model East	418418	7444162	Dry Hole
Model West	614040	7465689	Gas Blowout

* All well site information provided by VINTAGE
† Coordinates in meters UTM 8 and 9 NAD27

A schematic diagram showing the placement of all field samples in Grandview Hills Prospect is presented as Figure 1 below. The reconciliation of survey samples is provided in tabular form in Appendix C, "Field Documentation and Survey Sample Information".

FIGURE 1



4.0 SAMPLE INSPECTION AND QA/QC ANALYSIS

4.1 Sample Inspection

All GORE-SORBER Exploration Survey samplers were inspected upon receipt at the GORE laboratory. Among the conditions checked were sampler container status, sampler container seal integrity, condition of the samplers, and proper sequence of sampler numbers. Field installation and retrieval documentation was received from PEREGRINE VENTURES in electronic form, and was also reviewed during sample reconciliation. This documentation is provided in Appendix C, "Field Documentation and Survey Sample Information".

Conditions of note include the following:

- Module 379600 found dug up by animals (not included in data processing)
- Module 379613 found dug up by animals (not included in data processing)
- Module 379625 found dug up by animals (not included in data processing)

The overall condition of survey samplers was evaluated as good, and GORE was able to proceed with analysis and interpretation of the survey samples. All samples were analyzed on GC/MS instruments in the GORE laboratory in Elkton, Maryland, USA. Analysis of all samples for this project proceeded without difficulty.

A complete sample reconciliation summary is provided in Appendix C, "Field Documentation and Survey Sample Information". This information shows the status of each sampler sent to the survey area, including all trip blank samples.

Laboratory analysis of the samplers was performed for an ultimate yield of 78 organic compounds, according to procedures and methods developed by GORE specifically for use with GORE-SORBER Exploration Surveys. These procedures and methods are discussed in Appendix B, "GORE-SORBER Exploration Survey, Surface Geochemical Sampling System". The list of organic compounds derived for the samples of this project are included below, in Table 2.

4.2 QA/QC Analysis

Following completion of laboratory analysis and data reduction, a comparison between the raw chemical data collected from the grid and model sample locations (collectively known as "field samplers") and the various categories of quality assurance / quality control blanks was done using linear discriminant analysis. The objective of this comparison was to evaluate whether there was obvious geochemical difference between the field class of samplers and the various blank classes, with respect to the measured compound data. Such differences indicate that field sample compound detections are not induced or extraneous, and may be taken as valid geochemical signals. This comparison is shown in Figure 2, in the form of canonical score plots for each sample and each sampler class. For this comparison, a plot of canonical score 1 versus 2 was selected to demonstrate the inherent difference between the various sampler classes.

Table 2: Analytical Compound List

Ethene/Ethane	cis-1,3/1,4-Dimethylcyclohexane	1,2,4-Trimethylbenzene
Propene	1-Octene	Octanal
1-Butene	Cycloheptane	Benzofuran
Butane	cis-1,2-Dimethylcyclohexane	Limonene
2-Methylbutane	Octane	Indane
1-Pentene	trans-1,3/1,4-Dimethylcyclohexane	Butylbenzene
Pentane	2,6-Dimethylheptane	1-Undecene
Furan	trans-1,2-Dimethylcyclohexane	Undecane
Carbon disulfide	Ethylcyclohexane	Nonanal
Cyclopentane	Ethylbenzene	1,2,4,5-Tetramethylbenzene
2-Methylpentane	m,p-Xylene	Camphor
3-Methylpentane	1-Nonene	Dodecane
2-Methylfuran	Styrene	Naphthalene
Methylcyclopentane	o-Xylene	Decanal
Cyclohexane	Nonane	Benzothiazole
2-Methylhexane	Cyclooctane	Tridecane
3-Methylhexane	Propylcyclohexane	2-Methylnaphthalene
cis-1,3-Dimethylcyclopentane	alpha-Pinene	Tetradecane
trans-1,3-Dimethylcyclopentane	Camphene	Caryophyllene
trans-1,2-Dimethylcyclopentane	Propylbenzene	Pentadecane
1-Heptene	1-Ethyl-2/3-methylbenzene	Hexadecane
Heptane	1,3,5-Trimethylbenzene	Heptadecane
Methylcyclohexane	beta-Pinene	Pristane
2,5-Dimethylhexane	1-Ethyl-4-methylbenzene	Octadecane
Toluene	1-Decene	Phytane
3-Methylheptane	Decane	Carbazole

Instrument blank class data represents analytical data recorded with no sample inserted in the GC/MS instrument, and is meant to show the inherent instrument condition. The method blank class records the analysis of clean, isolated GORE-SORBER Modules, and is meant to demonstrate analytical process conditions. The inventory blank class presents data for isolated "unused" samplers (retained in inventory at the laboratory but assigned to the project) from the same sample lot as those sent to the field. The trip blank class of data records the conditions present to the survey samples in transit to and from the field, and should be similar to the "unused" sample class.

Figure 1 shows three significant features:

1. Instrument and method blank classes are different from the field sampler class, with respect to score 1. This implies that the chemical signatures of field samples are not related to the instrument or analytical conditions.

2. The separation of cluster centroids between the trip and inventory blanks and the field sampler class indicates that the field sampler class contains valid signal not significantly related to transit, but rather a result of exposure to the shallow subsurface environment.
3. The trip and inventory blank classes tend toward the same region of the plot. The overlap of trip and inventory classes indicates that there was no transit-related influence.

As a result of this analysis, the sample data were evaluated as fundamentally fit for use in further processing and geochemical model development.

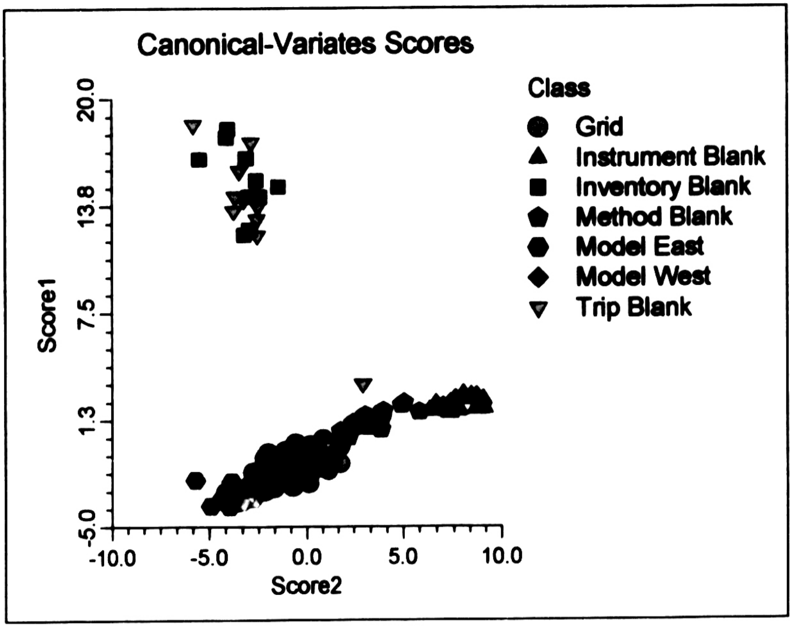


Figure 2: Canonical score plot of score 1 versus score 2 for all sample classes. Canonical scores relate to distinct mixtures of organic compounds detected in the survey (not shown here). Separation between field sample class and various blank sample classes demonstrates acquisition of in situ geochemical signatures and hence data validity.

Following linear discriminant analysis, a preliminary review of field sample signal and blank sample noise outputs (signal to noise ratios) was performed and certain chemical variables were disqualified, where appropriate. Additionally, field installation and retrieval documentation was further evaluated to identify samples that may have undergone severe disturbance or tampering in the field. Where appropriate, these samples were removed from the data set. The resulting data were then further evaluated using more rigorous statistical algorithms to characterize the overall geochemical data space. This process aids identification of additional chemical variable and sample outliers that may need to be disqualified prior to model development. During this data evaluation, no samples were removed from the data set.

The net result of the foregoing evaluation and processing steps was a statistical data matrix, based on a series of qualified chemical variables and field samples. This statistical matrix was used as input in the geochemical modeling steps.

5.0 GEOCHEMICAL MODELING

5.1 Overview of Methodology

This section presents in general terms the objective and strategy of the geochemical modeling process, as developed by GORE and applied to numerous GORE-SORBER Exploration Surveys. A sound modeling strategy is fundamental to the successful application of this geochemical approach.

Various hydrocarbon compounds exist naturally in the soil gas environment even in areas without petroleum accumulations. The geochemical variations in soil gas data that distinguish subsurface sources of hydrocarbons from surface sources of hydrocarbons are often very subtle and hence difficult to identify visually. Therefore, data derived from the analysis of soil gas samples are processed statistically using such approaches as "Hierarchical Cluster Analysis" and "Discriminant Analysis". For brief descriptions of these methods as applied to the study of soil gas data, refer to Appendix B, "The GORE-SORBER Exploration Survey Surface Geochemical Sampling System".

The fundamental objective of GORE geochemical data interpretation is to identify areas of hydrocarbon emanation, which indicate potential subsurface accumulations of petroleum (oil, condensate or gas). This is done with a process of geochemical modeling, developed by GORE specifically for use with GORE-SORBER Exploration Survey data. The geochemical modeling process usually includes defining the character of both petroliferous hydrocarbon and background soil gas signatures, using the GORE-SORBER Module at several "known" locations or model well sites (this is referred to as the "supervised" approach). Good producing wells which are in the same geological setting, have analogous production, are not depleted and are near to original pressure conditions, are the best candidates for the process of modeling petroliferous character. Dry well sites at which absolutely no hydrocarbons were detected along the stratigraphic column are the best candidates for modeling geochemical background. Furthermore, 10 to 15 samples are used at each model site to sample the geochemical variability of the influence of interest.

A significant assumption of the geochemical modeling method is that the soil gas signature in the vicinity of a producing well represents accurately and consistently the surface expression of the subsurface hydrocarbon accumulation. The theoretical framework for this assumption is the concept of vertical migration of hydrocarbon molecules from the reservoir to the surface, a phenomenon also termed "microseepage". In a practical sense, this assumption has proven valid over the course of many geochemical surveys.

If no such "known" model well sites are available in the specific survey area, a process of geochemical data clustering is used to determine appropriate samples for modeling petroleum influence and/or geochemical background. A technique known as Hierarchical Cluster Analysis is used in this situation (this is referred to as the "unsupervised" approach). In general, a modeling strategy based on "known" subsurface hydrocarbon presence or absence will yield better results than a purely "unsupervised" approach, even with less than optimal model wells.

It is important to recognize that the process of geochemical modeling is iterative in that several model calculations may proceed until the best statistical result is obtained. Documentation of all geochemical models that are developed is retained for future reference if needed and for comparison with optional future reprocessing should new information become available.

Among the geochemical criteria used to evaluate a model result are the hydrocarbon compounds that correlate with the reservoir and background signatures, and how well the geochemical model predicts the actual samples used to create the model. Geological validation of a model is done by comparison to other exploration information, such as structural interpretations from seismic data. Also, the prediction of other well sites that were not used in creating the model is a useful benchmark for model validation. Hence, a particular geochemical model will be selected as the most objective; this model is subsequently presented and discussed.

Based on the foregoing discussions, it is clear that the results of the modeling process are governed by several factors, including:

- Proper selection of geochemical model sites (specific well sites) to characterize the target geochemical signature (thermogenic hydrocarbons) and background signature;
- Qualified list of chemical variables (compounds) to be used for statistical pattern recognition in the modeling process;
- Qualified set of samples to be retained for processing and therefore define the character of the geochemical data space with respect to the qualified chemical variables;
- The specific samples selected from the model well sites and used to define the petroliferous and background signatures (the geochemical model).

As with most exploration programs, new information may become available which might necessitate the data be reprocessed and/or remodeled to obtain a more refined result. Unlike other geochemical exploration tools, the GORE-SORBER Exploration Survey technique is based on changes in, and measurement of, subtle geochemical patterns on each sampler resulting from exposure to subsurface geochemical influences (rather than measurement and mapping of a limited number of chemical variables). As such, if there is a logical basis for adjustment of one or more of the factors identified above the data can be reprocessed and remodeled to develop a more robust or realistic model.

5.2 Survey Specific Modeling Information

The objective of this surface geochemical survey was to evaluate portions of the Grandview Hills Prospect for potential thermogenic hydrocarbon charge. A 'supervised' modeling approach was used to fulfill this objective, using samples deployed at specific gas production and dry well sites. Model sample site information was previously summarized in Section 3, Table 1.

Geochemical models of gas production are possible using the samples of these model well sites. Comparison of the model sample data to survey grid samples allows the distribution of emanations from these horizons to be determined throughout the survey area. Due to the critical nature of these geochemical modeling sites to the subsequent interpretation of the geochemical data, it is appropriate to review the fundamental assumptions of the geochemical modeling process. These assumptions should be kept in mind when reviewing the material in this report.

- Gas production well site model samples were collected at locations directly above subsurface accumulations of such hydrocarbons, and represent accurately and consistently the surface geochemical expression of these hydrocarbons
- The Model East site designated for sampling geochemical background character was valid, in the sense that no appreciable hydrocarbons were present at the location.

6.0 GEOCHEMICAL SURVEY RESULTS

A discussion of the data processing and interpretational results completed to meet the objectives of this geochemical survey is presented below.

It is important to realize that the results of geochemical modeling are empirical, and are a function of and defined only with respect to the specific data of this survey. Moreover, hydrocarbon compounds will appear in the profile of geochemical background character, meaning that not every hydrocarbon compound correlates with the occurrence of gas accumulations. The geochemical modeling process is meant to identify those hydrocarbon compounds that correlate with gas emanation character defined by the selected model sets.

6.1 Geochemical Model Development for Gas-like Signature

A geochemical model to characterize gas emanation in the survey area was developed using samplers placed near the Model West well site (gas blowout). Geochemical background was modeled from samplers placed near the Model East dry well site. Collectively, these samples were used to develop geochemical model 10.1 for Gas-like signature. It should be understood that this model represents the surface character of gas emanation near the Model West well site.

Discriminant analysis was performed using these model samples, with the gas well model samples as one end-member, and the dry well model samples as a second end-member in a statistical separation. The orientation of maximum separation between these two end-members was determined in the data space defined by the analytical values derived for each organic compound in the target compound list (given above in Section 4.1). The correlation between this orientation and each compound was calculated for the samples of the end-members.

Compound correlation information is presented below, as the definition of this geochemical model. A plot of the relative significance of target hydrocarbon compounds to either the petroleum production character or the background character is shown as Figure 3. Each compound is shown as a line drawn either on the gas character side or the background character side of the plot. The longer this line, the more significant the compound is to either the gas or background character. If the compound plots within the gas character, that compound is correlated to the gas production character, and is more likely a constituent of gas influence in the survey area. Significance of a compound to one influence does not imply absence of that compound from samples of the opposing influence, simply a higher likelihood of being related to the first influence.

Geochemical Model 10.1 for Gas-like signature appears to be statistically stable and reasonable in our experience. The model is stable in the sense that neither the "Gas-like Character" nor the "Geochemical Background Character" is a function of a single compound only, or a small number of related compounds in a narrow analytical range. Such conditions are a sign of model instability, as isolated compounds or single compound occurrences are not thought to represent realistic geochemical source influences.

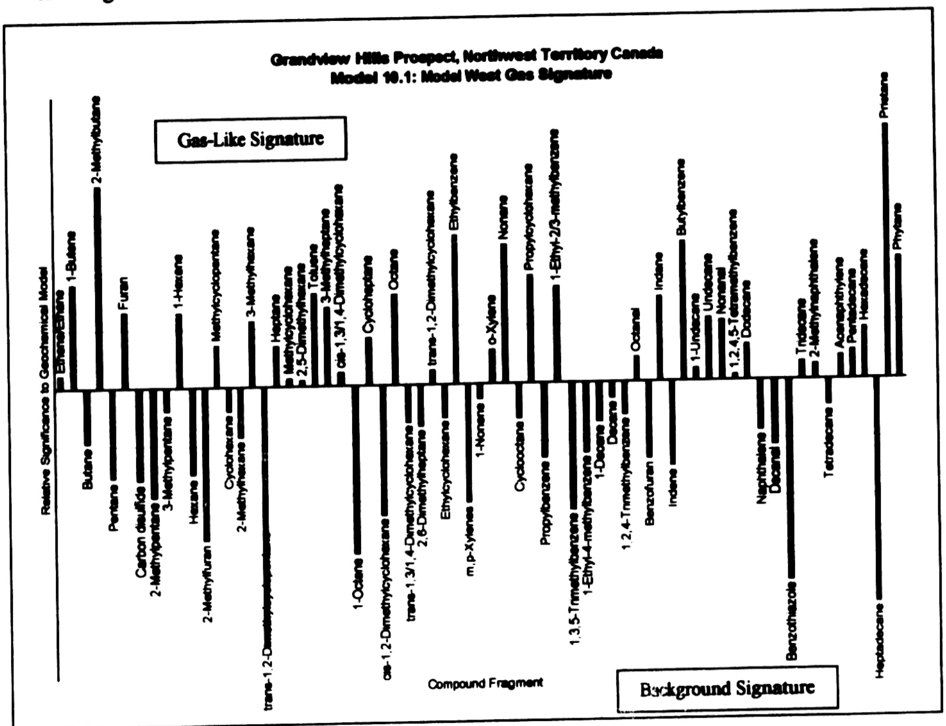


Figure 3: Plot of Geochemical Model 10.1 for gas emanation in Grandview Hills Prospect showing the contribution of specific organic compounds to the model. This model represents gas signature in comparison with geochemical background signature measured near the Model East dry well. Compounds are shown in analytical order.

This model is considered reasonable in the sense that the "Gas-like Character" portion of the model plot includes prominent light aliphatic compounds (ethane, butene, methylbutane).

6.2 Geochemical Model Results

Geochemical Model 10.1 was compared to all geochemical samples from the Grandview Hills Prospect and values were derived which quantify the similarity between the survey samples and the model signature for gas-like character. This similarity is expressed as a probability value, from 0% to 100%, of matching this gas character, as measured in the vicinity of the gas well site sampled for modeling purposes. Probability values for all samples are given in Appendix A, "Geochemical Model Probability Values".

These probability values are presented on a color contour map included with this report. This map illustrates the computer-generated contour surface of probability values interpolated from each sample location. The configuration of the contoured surface is as much a function of local sample density as of the sample probability values. When viewing the contoured data surface, it is important to realize that probability values are most accurate at the actual sampled locations (the contouring algorithm honors the discrete sample points).

Important Notes:

- The contour surface developed between actual sampled locations is an estimate of the probability values calculated for the samples, and is subject to uncertainty.
- The degree of uncertainty in this estimate will increase with distance from each sampled location.
- The interpolation of the data surface does not account for discontinuity within the survey area (faulting or other geological boundary conditions).

High probability values indicate regions within the survey areas that exhibit similar character to the gas signature, as defined by surface emanation near the sampled Model West gas well site. A geochemical feature, as referred to in this report, is defined as any collection of contoured probability values that seem to exhibit a common geochemical influence.

General observations and comments for Geochemical Model 10.1 of Gas-like signature are summarized below. The following remarks assume that model samples represent accurately known subsurface gas accumulations or geochemical background conditions.

- The average self-predicted probability value for the selected Model West gas well site was 94. Samples located near this well site were used in the creation of the geochemical model for Gas-like signature.
- The average self-predicted probability value for the selected samples located at the Model East dry well site was 10. These samples were used to represent geochemical background in the construction of the geochemical model.

Refer to the map labeled "Gas-like Signature" for the location and configuration of geochemical features defined by this model. The survey area as a whole is characterized by small one or two sample point sized geochemical features. In general, the western and southeastern portions of the survey area were more anomalous than other areas.

7.0 SUMMARY & CONCLUSIONS

The results of the GORE-SORBER® Exploration Survey conducted over the Grandview Hills Prospect in the Northwest Territories of Canada, are summarized below.

The objective of this surface geochemical survey was to evaluate portions of the Grandview Hills Prospect for potential thermogenic hydrocarbon charge.

Geochemical Model 10.1 was developed to characterize gas emanation in the survey area, using samplers placed near the Model West well site. Geochemical background was modeled from samplers placed near the Model East dry well site. It should be understood that this model represents the surface character of gas emanation near the productive well site.

This model shows small one and two point geochemical features throughout the survey area. In a general sense, the western portion and southeastern portion of the survey area is somewhat more anomalous than the other areas.

The ultimate significance of any geochemical observations and features noted for the Grandview Hills Prospect with respect to regional geological or structural trends, is not fully known by GORE at this time. Realistic appraisal of prospectivity will require further rigorous geological interpretation by VINTAGE, in order to select the best areas for further exploration.

APPENDIX A
Geochemical Model Probability Values

10754443 VINTAGE NWT Canada
Model 10.1: Model West (gas) v Model East (dry)

Module	Sample	Easting	Northing	Zone	Class	P(gas)
379458	01	377594	7466263	9	Grid	1
379459	02	376861	7465566	9	Grid	2
379460	03	376083	7464956	9	Grid	5
379461	04	375287	7464350	9	Grid	0
379462	05	374501	7463724	9	Grid	100
379463	06	376790	7461654	9	Grid	98
379464	07	376446	7462590	9	Grid	2
379465	08	376108	7463530	9	Grid	98
379466	09	375790	7464394	9	Grid	72
379467	10	375459	7465339	9	Grid	8
379468	11	375157	7466196	9	Grid	1
379469	12	374801	7467134	9	Grid	38
379470	13	374432	7468197	9	Grid	100
379471	14	374168	7468916	9	Grid	57
379472	15	375982	7466845	9	Grid	2
379474	16	377204	7467812	9	Grid	0
379473	17	376481	7467256	9	Grid	44
379475	18	377914	7467335	9	Grid	11
379476	19	379116	7467872	9	Grid	0
379477	20	379868	7468794	9	Grid	100
379478	21	380760	7469253	9	Grid	100
379479	22	381410	7469427	9	Grid	34
379480	23	382589	7469753	9	Grid	70
379481	24	383643	7470199	9	Grid	80
379488	25	384770	7471197	9	Grid	96
379489	26	385705	7471807	9	Grid	66
379490	27	381592	7473177	9	Grid	0
379492	29	415876	7485028	9	Grid	1
379493	30	416227	7483254	9	Grid	97
379494	31	416348	7482132	9	Grid	93
379495	32	416986	7481104	9	Grid	66
379496	33	417100	7478980	9	Grid	86
379497	34	417640	7477737	9	Grid	91
379498	35	418264	7476886	9	Grid	88
379499	36	418103	7475663	9	Grid	0
379500	37	417853	7474938	9	Grid	3
379501	38	418162	7473317	9	Grid	100
379502	39	418556	7472302	9	Grid	1
379503	40	418151	7471482	9	Grid	100
379504	41	403274	7482180	9	Grid	73
379505	42	403064	7481648	9	Grid	100
379506	43	402970	7480136	9	Grid	8
379507	44	402880	7478759	9	Grid	1
379508	45	402829	7478019	9	Grid	8
379509	46	402890	7477257	9	Grid	0
379510	47	402708	7476177	9	Grid	0
379511	48	402697	7474872	9	Grid	88
379512	49	402340	7474003	9	Grid	95
379513	50	402666	7473001	9	Grid	4
379514	51	402783	7471716	9	Grid	0

10754443 VINTAGE NWT Canada

Model 10.1: Model West (gas) v Model East (dry)

Module	Sample	Easting	Northing	Zone	Class	P(gas)
379515	52	402299	7470963	9	Grid	94
379516	53	394165	7478689	9	Grid	30
379517	54	394755	7482527	9	Grid	98
379518	55	394941	7481190	9	Grid	24
379519	56	394643	7480224	9	Grid	95
379520	57	394430	7479546	9	Grid	23
379521	58	393868	7477756	9	Grid	33
379522	59	393489	7476529	9	Grid	18
379523	60	393235	7475738	9	Grid	69
379524	61	392923	7474773	9	Grid	2
379525	62	392716	7474080	9	Grid	9
379526	63	392214	7473121	9	Grid	95
379527	64	395173	7478663	9	Grid	91
379528	65	396130	7478627	9	Grid	93
379529	66	397322	7478679	9	Grid	93
379530	67	398136	7478607	9	Grid	9
379531	68	393147	7478720	9	Grid	0
379532	69	392167	7478756	9	Grid	99
379533	70	391192	7478793	9	Grid	48
379534	71	390102	7478825	9	Grid	15
379535	72	371849	7450788	9	Grid	0
379536	73	372975	7450858	9	Grid	10
379537	74	373917	7451011	9	Grid	0
379538	75	375037	7451196	9	Grid	41
379539	76	375919	7451274	9	Grid	0
379540	77	377078	7451008	9	Grid	1
379541	78	378257	7450757	9	Grid	100
379542	79	378882	7450721	9	Grid	100
379543	80	379880	7450676	9	Grid	25
379544	81	380806	7450619	9	Grid	76
379545	82	382054	7450545	9	Grid	96
379546	83	378627	7444880	9	Grid	97
379547	84	377809	7445010	9	Grid	83
379551	85	376531	7445578	9	Grid	24
379552	86	375371	7445392	9	Grid	3
379553	87	374427	7445534	9	Grid	6
379554	88	373355	7445694	9	Grid	2
379555	89	372361	7445879	9	Grid	44
379556	90	371176	7446293	9	Grid	45
379557	91	370403	7446412	9	Grid	23
379558	92	630169	7446503	8	Grid	66
379559	93	629177	7446458	8	Grid	0
379560	94	379408	7472028	9	Grid	100
379561	95	380137	7471071	9	Grid	9
379562	96	380559	7470530	9	Grid	1
379563	97	381950	7468715	9	Grid	0
379564	98	382700	7467739	9	Grid	46
379565	99	383051	7467270	9	Grid	0
379566	100	383152	7474867	9	Grid	4
379567	101	378668	7471283	9	Grid	2

10754443 VINTAGE NWT Canada

Model 10.1: Model West (gas) v Model East (dry)

Module	Sample	Easting	Northing	Zone	Class	P(gas)
379568	102	378108	7470841	9	Grid	2
379569	103	377146	7470081	9	Grid	0
379570	104	376853	7469505	9	Grid	20
379571	105	375700	7468765	9	Grid	0
379572	106	375736	7471410	9	Grid	1
379573	107	372993	7462200	9	Grid	0
379574	108	371687	7461568	9	Grid	69
379575	109	370823	7460048	9	Grid	1
379576	110	373366	7465229	9	Grid	100
379577	111	372468	7464123	9	Grid	8
379578	112	371104	7463853	9	Grid	9
379579	113	371825	7471001	9	Grid	41
379580	114	372450	7469839	9	Grid	100
379581	115	371619	7468875	9	Grid	73
379582	116	371116	7469459	9	Grid	100
379598	117	434215	7438351	9	Grid	1
379599	118	435236	7439083	9	Grid	85
379601	120	436747	7440737	9	Grid	26
379602	121	436989	7441276	9	Grid	6
379603	122	437976	7441964	9	Grid	0
379604	123	438637	7442625	9	Grid	0
379605	124	438896	7443478	9	Grid	38
379606	125	440164	7444153	9	Grid	7
379607	126	433374	7437909	9	Grid	48
379608	127	431876	7437241	9	Grid	1
379609	128	431257	7436912	9	Grid	99
379610	129	430407	7436491	9	Grid	100
379611	130	429760	7436241	9	Grid	0
379612	131	428064	7435880	9	Grid	99
379613	132	427364	7435071	9	Grid	99
379614	133	426654	7434733	9	Grid	5
379615	134	425313	7434463	9	Grid	59
379616	135	422825	7432875	9	Grid	65
379617	136	433345	7439835	9	Grid	98
379618	137	433265	7440971	9	Grid	99
379619	138	432800	7441393	9	Grid	10
379620	139	432672	7442136	9	Grid	0
379621	140	432400	7443270	9	Grid	11
379622	141	431671	7443564	9	Grid	100
379623	142	431462	7443967	9	Grid	21
379624	143	430388	7445168	9	Grid	73
379625	144	430149	7446927	9	Grid	100
379626	145	429944	7447998	9	Grid	7
379627	146	429052	7449422	9	Grid	35
379628	147	428560	7449693	9	Grid	96
379629	148	427728	7450139	9	Grid	15
379630	149	427674	7450627	9	Grid	1
379631	150	427171	7452256	9	Grid	68
379632	151	427172	7452545	9	Grid	0
379633	152	426734	7453246	9	Grid	4

10754443 VINTAGE NWT Canada

Model 10.1: Model West (gas) v Model East (dry)

Module	Sample	Easting	Northing	Zone	Class	P(gas)
379634	153	426100	7454339	9	Grid	13
379635	154	425121	7455057	9	Grid	1
379636	155	425487	7456481	9	Grid	17
379637	156	429680	7451258	9	Grid	12
379638	157	430970	7451192	9	Grid	68
379639	158	432469	7451765	9	Grid	27
379640	159	432856	7452257	9	Grid	22
379641	160	433643	7452227	9	Grid	32
379642	161	435380	7452926	9	Grid	0
379644	163	437850	7454300	9	Grid	1
379645	164	426625	7448972	9	Grid	100
379646	165	417378	7470773	9	Grid	65
379647	166	417632	7469949	9	Grid	3
379648	167	417624	7468514	9	Grid	58
379649	168	417665	7467763	9	Grid	1
379650	169	417777	7466385	9	Grid	95
379651	170	418130	7464955	9	Grid	25
379652	171	418008	7464120	9	Grid	0
379653	172	417408	7463334	9	Grid	99
379654	173	417479	7461996	9	Grid	67
379655	174	417246	7460500	9	Grid	0
379656	175	416371	7458846	9	Grid	0
379657	176	416602	7458334	9	Grid	0
379658	177	417256	7457619	9	Grid	0
379659	178	416373	7456725	9	Grid	10
379660	179	415717	7456166	9	Grid	100
379661	180	418887	7456293	9	Grid	90
379662	181	422435	7457003	9	Grid	7
379663	182	427297	7456599	9	Grid	60
379664	183	428194	7457625	9	Grid	5
379665	184	429216	7459206	9	Grid	0
379666	185	429421	7459743	9	Grid	0
379667	186	430672	7460275	9	Grid	1
379668	187	431327	7461756	9	Grid	0
379669	188	432684	7461948	9	Grid	98
379670	189	432570	7463635	9	Grid	50
379677	190	432522	7464442	9	Grid	97
379678	191	433879	7463533	9	Grid	38
379679	192	434501	7464492	9	Grid	3
379680	193	435012	7465023	9	Grid	93
379681	194	425720	7448760	9	Grid	48
379682	195	425296	7447632	9	Grid	1
379683	196	422821	7448391	9	Grid	5
379583	ME1	418442	7444128	9	Model East	9
379584	ME2	418463	7444147	9	Model East	68
379585	ME3	418464	7444152	9	Model East	0
379586	ME4	418466	7444168	9	Model East	0
379587	ME5	418471	7444180	9	Model East	0
379588	ME6	418465	7444191	9	Model East	9
379590	ME8	418439	7444220	9	Model East	0

10754443 VINTAGE NWT Canada

Model 10.1: Model West (gas) v Model East (dry)

Module	Sample	Easting	Northing	Zone	Class	P(gas)
379591	ME9	418429	7444219	9	Model East	31
379592	ME10	418424	7444211	9	Model East	3
379593	ME11	418414	7444196	9	Model East	98
379594	ME12	418409	7444191	9	Model East	0
379595	ME13	418398	7444178	9	Model East	1
379596	ME14	418392	7444167	9	Model East	3
379597	ME15	418391	7444157	9	Model East	1
379443	MW1	613997	7465703	8	Model West	98
379445	MW3	614009	7465692	8	Model West	100
379446	MW4	614015	7465677	8	Model West	88
379447	MW5	614015	7465673	8	Model West	86
379448	MW6	614017	7465669	8	Model West	95
379449	MW7	614026	7465658	8	Model West	100
379451	MW9	614048	7465673	8	Model West	94
379452	MW10	614039	7465705	8	Model West	91
379454	MW12	614014	7465721	8	Model West	100
379456	MW14	614011	7465732	8	Model West	100
379457	MW15	614000	7465728	8	Model West	77

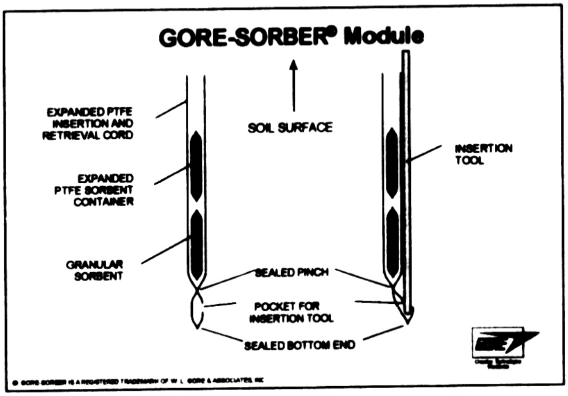
APPENDIX B
The GORE-SORBER Exploration Survey
Surface Geochemical Sampling System

Exploration Survey Applications
The GORE-SORBER Exploration Survey method is a surface geochemical sampling system employing the GORE-SORBER® module (patented passive soil vapor sampling device), state-of-the-art chemical analysis and sophisticated statistical geochemical pattern recognition. This surface geochemical sampling technique has evolved from over fifteen years of experience in soil gas geochemical exploration and analytical chemistry, and is capable of differentiating reservoir hydrocarbons from "background" hydrocarbons (emanating from vegetation, shallow pollution, source rock, etc.).

Typical applications of this technique include: 1) Frontier - to determine hydrocarbon potential over large previously unexplored areas; 2) Exploration - focus geophysical efforts, prioritize leads or investigate stratigraphic traps; 3) Development - define the areal extent of producing fields and locate potential areas for secondary recovery. Prudent use and integration of the geochemical results can have significant benefits to the success of an exploration program, resulting in fewer dry holes.

Description of GORE-SORBER Module Sampling Device
Each GORE-SORBER module contains a minimum of two (duplicate) samples and consists of several separate passive sorbent collection units called sorbers. Each sorber contains an equal amount of a suitable granular adsorbent material. Specific polymeric and carbonaceous resins have been carefully selected as adsorbent materials because of their affinity for a broad range of volatile organic compounds and semi-volatile organic compounds (VOCs and SVOCs), while minimizing uptake of water vapor (the principal soil gas constituent in most areas). The sorbers are sheathed in the bottom of a vapor-permeable retrieval cord looped at the top. The loop is used as a means of tying the module to a string for installation and retrieval. The figure below shows a typical GORE-SORBER module. The retrieval cord and the sorbent containers (sorbers) are constructed of an inert, hydrophobic, microporous expanded polytetrafluoroethene (ePTFE) membrane. The microporous structure of the membrane allows vapors to move freely across and onto the sorbent material. The microporous structure protects the granular adsorbents from physical contact with soil particulates and water ensuring a consistent mechanism for collection of organic compounds (vapor-phase transfer only). The GORE-SORBER module is installed to a depth of one to two feet (30 to 60 centimeters) by creating a small pilot hole using a narrow steel rod or similar tool and inserting the sampler manually using a narrow insertion tool provided by GORE. The sampler is retrieved by hand and returned to GORE for analysis and data processing.

The unique ability to protect the sorbent media from contact with ground and soil pore water without retarding soil vapor diffusion facilitates the application of the GORE-SORBER Exploration Survey method in very low permeability and poorly drained soils and swamp areas.



Schematic of the GORE-SORBER Module

Quality Assurance (QA) Measures

As standard practice, all modules are individually numbered and tracked throughout the entire manufacturing, field deployment, and analytical process. Completed modules are subjected to a "bake-out" under a nitrogen blanket in a vacuum oven prior to shipment to the customer. Finally, each module is sealed into a clean glass vial. All modules are transported to and from the customer's site in sealed glass vials and boxes supplied by GORE. Five to ten additional trip blanks will accompany the modules to and from the site for QA/QC purposes. Associated method blanks, instrument blanks, inventory blanks and trip blanks are tested with each project as controls.

Geochemical Survey Design

Prior to initiating a survey, specific survey objectives are established with the client and an appropriate sampling scheme and modeling strategy are identified. Information relating to target size and type, any preferred reservoir orientation characteristics, such as a channel sand, and the existence of analogous production and specific well characteristics and production history are important factors in developing an appropriate survey design. Of paramount importance is what decisions are expected to be made based on the geochemical results. The survey design must be sufficient to support or minimize the uncertainty of decisions affecting the "next step" in the exploration program.

Sampling plans typically follow a grid pattern with regular or variable spacing of samplers, sampling traverses, or a combination of both. Sample spacing generally ranges from 300 meters to one kilometer. Appropriate wells are selected for the purpose of modeling surface geochemical character over analogous production and dry/background areas.

Exploration Survey Installation and Retrieval Procedures
Installation of the modules is performed either by experienced subcontract field personnel or by the customer. The GORE-SORBER module is installed to an average depth of one to two feet (30 to 60 cm) below grade by driving a narrow (1cm diameter) pilot hole with a narrow steel tool (like a long screwdriver) and a mallet, if necessary.

After the pilot hole is completed, modules are tied to a section of cord and inserted into the completed boreholes, using the stainless steel insertion rod supplied by GORE. The cord is secured at the ground surface by collapsing the hole. The location of the sample is marked on a map and location coordinates are secured where possible with a global positioning system (GPS) receiver, preferably equipped with a buffer for data storage and subsequent download to a personal computer. Additional modules that are designated as trip blanks should be noted on the installation/retrieval log and left (unopened) in the shipping box for the duration of the field exposure.

Module retrieval requires that field personnel locate the retrieval cord and manually pull the module from each location. The cord is separated from the module and discarded properly. The exposed modules are resealed in their respective designated shipping vials and placed in the supplied shipping box. Boxes with field-exposed modules and trip blanks are returned along with the Chain-of-Custody (COC) form to GORE's laboratory in Elkton, Maryland in the United States, usually via overnight courier.

Module Exposure Time
GORE's suggested target time for module exposure time is 17 days.

Analytical Procedures
All GORE-SORBER Exploration Survey samplers are inspected upon receipt at the GORE laboratory. Among the conditions checked are sampler container seal integrity, condition of the samplers, and proper sequence of sampler numbers. Samples are then transferred to a temporary storage location until analysis.

Each GORE-SORBER module contains a minimum of two duplicate samples that are available for analysis. One sample is extracted from the GORE-SORBER module prior to analysis by cutting the bottom of the retrieval cord. The replicate samples remain in sample storage until discarded, or subsequent analysis is required. All soil gas samples are analyzed by thermal desorption followed by gas chromatographic separation and mass selective detection (TD/GC/MS). The laboratory analytical method has been developed by GORE specifically for application with petroleum geochemical exploration and yields chemical data for a wide variety of organic and petroleum hydrocarbon compounds in the C_2 (ethane) to C_{20} (phytane) range.

Before each analytical run sequence, two instrument blanks, a sampler exposed to a BFB (bromofluorobenzene) standard, and a method blank are analyzed. A method blank and a BFB standard are also analyzed after every 30 samples and/or trip blanks. Calibration standards are analyzed at the beginning of each run, after every 30 samples and/or trip blanks, and at the end of the run sequence. Compound identification is based on the presence of appropriate target compound mass fragments within a specific retention-time window, as determined through use of reference standards.

Trip blank samples that are shipped with the survey modules and are selected at random by field personnel are also analyzed. Prior to data processing, trip blank, method blank, inventory blanks and instrument blank data are reviewed to identify potential ambient exposures, or laboratory conditions, which may affect data quality

GORE's laboratory operates under the guidelines of its "Quality Assurance Manual, Operating Procedures and Methods". The quality assurance program is consistent with Good Laboratory Practices (GLP) and ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories", 3rd edition, 1990. The Laboratory has also been certified to be in conformance with the National Environmental Laboratory Accreditation Conference (NELAC) Chapter 5, Quality System Standards which was proposed for adoption in July 1997 by the U.S. EPA, Federal and State officials as the national environmental laboratory performance standard for the United States.

Data Processing and Modeling

The GORE-SORBER Exploration Survey incorporates sophisticated statistical processing and modeling of the complex geochemical signatures (in the range of C_2 to C_{20}) obtained for each sample. Some of the processes used include hierarchical cluster analysis and discriminant analysis.

Hierarchical Cluster Analysis

Hierarchical cluster analysis (HCA) is often called an "unsupervised" multivariate technique, since no additional information other than the data itself is required to perform the operation. That is, it is not necessary to identify "end-members" of the data or qualify the data in any manner in order to perform subsequent comparison or evaluation of the data, as is the case with multivariate classification techniques. HCA proceeds by grouping samples of like composition according to the values of all input variables. The result is a list of subsets of samples of the data, which are alike (forming "clusters" of similar samples). Since the input variables of the data are in the form of hydrocarbon compound intensities, the clusters are subsets of chemically similar samples. The HCA method is used to determine the structure of a set of data when no other geological or geophysical information for the prospect is available. The results of HCA may be used to further classify the samples of the data (i.e.; whether particular samples show petroleum hydrocarbon influence).

Discriminant Analysis

Discriminant analysis (DA) is a multivariate data classification technique. At least two subsets of input samples must be identified as belonging to separate groups (with any such "group" of samples presumably representative of a particular physical influence in the sampled environment). The DA technique will then find the best separation of the groups in a minimum residual sense, in terms of the input variables for the samples. Since the input variables are of a chemical nature, the separation of the sample groups is expressed as a chemical difference between the groups. The classification of samples of unknown influence is then performed; each unknown sample is compared to the identified groups of samples and a probability of match to each sample group is calculated. Therefore, if a group of samples is identified as petroleum-influenced, and another group of samples is identified as being like geochemical background, DA will statistically describe the difference between these two groups. The comparison of unknown samples to these two groups will yield for each unknown sample a probability of being like the petroleum influence, as well as a probability of being like the geochemical background influence.

Contour Maps of Geochemical Probabilities

Graphic presentation of the geochemical survey results is presented by overlaying the contoured probability values derived from the model onto CAD maps supplied by the customer. Either minimum surface curvature or kriging models are employed. Typical map plot sizes range from "B-sized" (11" x 17") to "E-size" (24" x 36"). The electronic site plan base map(s) provided by the customer should include a scaled drawing (with relevant site features), digitized in ground coordinates (UTM, State plane, etc). Map projection information should also be included.

Reporting of Results

The results of the GORE-SORBER Exploration Survey are summarized in a brief report which includes a review of survey objectives, design, modeling information and results. Field summary documentation, model probability summary table, and color contour maps of petroleum-like probability distribution (compared to the model) are also included.

Interpretation and Integration of Exploration Survey Results

The results of a GORE-SORBER Exploration Survey are expressed in terms of probability that a given grid sample exhibits the surface geochemical character associated with known reservoir hydrocarbon accumulations, as defined by model set samples placed around analogous production wells and dry or background wells. These data should always be integrated with other geological or geophysical information to prioritize areas for further exploration.

In reviewing the results of a specific survey the following factors should be considered:

Fault Zones: Greater emanation of hydrocarbons is generally associated with fault zones. Additionally the geochemical signature of emanations along a fault zone will differ from that of the geochemical model developed over a reservoir. Thus, near surface free petroleum associated with fault zone seepage would not be expected to correlate to or appear anomalous with respect to a model developed over a reservoir accumulation.

Correlation with Structures: A geochemical anomaly map is a surface plan view of the distribution of all contributing analogous petroliferous geochemical influences throughout the stratigraphic column. The detected anomalies may correlate with structural traps on one or more horizons, or with stratigraphic traps that have not been resolved with geophysical methods; similarly a potential target may be shown to be geochemically unprospective.

Contour Plots: The geochemical maps represent an objective computer-derived probability value surface interpolated from grid point values. No effects or influences from the underlying geology (such as fault boundaries or other structures) are specifically accounted for in the contour interpolation. However, such boundary conditions or other geological features *should* impact the configuration of a geochemical anomaly. The exploration geoscientist is encouraged to independently hand contour the probability surface using his or her expert geological and geophysical knowledge of the prospect or region (integration of information).

Contour Uncertainty: Probability values are most accurate at the sampled locations. The contour surface developed between the data points is an estimate of the probability and is subject to uncertainty, which increases with distance from each sample location. Further resolution of the contoured surface may be appropriate through additional soil gas sampling depending on the end-use of the data.

APPENDIX C

Field Documentation and Survey Sample Information

1. Module Reconcile Sheets
2. Field Documentation received from PEREGRINE VENTURES

Grandview Hills Prospect

Sample Database

NOTES	PERSONNEL	WORK AREA
JF=Jet Fuel B sample JE=Jet Exhaust sample d2=severely disturbed m=model b=blank	Alec Vittrekwa Joul Clarkston-Pilot Rowland Rincon Jim Evans-Pilot Geoff Reed-Pilot	Thunder River Prospect R.Rincon placed and retrieved all Samples
EXP=Exposure Time (days)	**SUMMARY INFO**	**MODELS**
	30 Total Models 10 Total Blanks 196 Total Samples 18.9 Average Exposure 0 Total Lost 3 Total d2	ME=Model to the East MW=Model to the West

samp q	mod q
1	1

Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
01	379458	25-Jul	14-Aug		20	
02	379459	25-Jul	14-Aug		20	
03	379460	25-Jul	14-Aug		20	
04	379461	25-Jul	14-Aug		20	
05	379462	25-Jul	14-Aug		20	
06	379463	25-Jul	14-Aug		20	
07	379464	25-Jul	14-Aug		20	
08	379465	25-Jul	14-Aug		20	
09	379466	25-Jul	14-Aug		20	
10	379467	25-Jul	14-Aug		20	
11	379468	25-Jul	14-Aug		20	
12	379469	25-Jul	14-Aug		20	
13	379470	26-Jul	14-Aug		19	
14	379471	26-Jul	14-Aug		19	
15	379472	26-Jul	14-Aug		19	
16	379474	26-Jul	14-Aug		19	
17	379473	26-Jul	14-Aug		19	
18	379475	26-Jul	14-Aug		19	
19	379476	26-Jul	14-Aug		19	
20	379477	26-Jul	14-Aug		19	
21	379478	26-Jul	14-Aug		19	
22	379479	26-Jul	14-Aug		19	
23	379480	26-Jul	14-Aug		19	
24	379481	26-Jul	14-Aug		19	
25	379488	26-Jul	14-Aug		19	
26	379489	26-Jul	14-Aug		19	
27	379490	26-Jul	14-Aug		19	
28	379491	26-Jul	14-Aug		19	
29	379492	26-Jul	14-Aug		19	
30	379493	26-Jul	14-Aug		19	
31	379494	26-Jul	14-Aug		19	

Vintage Petroleum, Inc.
Grandview Hills Prospect

Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
32	379495	26-Jul	14-Aug		19	
33	379496	26-Jul	14-Aug		19	
34	379497	26-Jul	14-Aug		19	
35	379498	26-Jul	14-Aug		19	
36	379499	26-Jul	14-Aug		19	
37	379500	26-Jul	14-Aug		19	
38	379501	26-Jul	14-Aug		19	
39	379502	26-Jul	14-Aug		19	
40	379503	26-Jul	14-Aug		19	
41	379504	26-Jul	14-Aug		19	
42	379505	26-Jul	14-Aug		19	
43	379506	26-Jul	14-Aug		19	
44	379507	26-Jul	14-Aug		19	
45	379508	26-Jul	14-Aug		19	
46	379509	26-Jul	14-Aug		19	
47	379510	26-Jul	14-Aug		19	
48	379511	26-Jul	14-Aug		19	
49	379512	26-Jul	14-Aug		19	
50	379513	26-Jul	14-Aug		19	
51	379514	26-Jul	14-Aug		19	
52	379515	26-Jul	14-Aug		19	
53	379516	27-Jul	14-Aug		18	
54	379517	27-Jul	14-Aug		18	
55	379518	27-Jul	14-Aug		18	
56	379519	27-Jul	14-Aug		18	
57	379520	27-Jul	14-Aug		18	
58	379521	27-Jul	14-Aug		18	
59	379522	27-Jul	14-Aug		18	
60	379523	27-Jul	14-Aug		18	
61	379524	27-Jul	14-Aug		18	
62	379525	27-Jul	14-Aug		18	
63	379526	27-Jul	14-Aug		18	
64	379527	27-Jul	14-Aug		18	
65	379528	27-Jul	14-Aug		18	
66	379529	27-Jul	14-Aug		18	
67	379530	27-Jul	14-Aug		18	
68	379531	27-Jul	15-Aug		19	
69	379532	27-Jul	15-Aug		19	
70	379533	27-Jul	15-Aug		19	
71	379534	27-Jul	15-Aug		19	
72	379535	27-Jul	15-Aug		19	
73	379536	27-Jul	15-Aug		19	
74	379537	27-Jul	15-Aug		19	
75	379538	27-Jul	15-Aug		19	
76	379539	27-Jul	15-Aug		19	
77	379540	27-Jul	15-Aug		19	
78	379541	27-Jul	15-Aug		19	
79	379542	27-Jul	15-Aug		19	
80	379543	27-Jul	15-Aug		19	
81	379544	27-Jul	15-Aug		19	
82	379545	27-Jul	15-Aug		19	

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Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
83	379546	27-Jul	15-Aug		19	
84	379547	27-Jul	15-Aug		19	
85	379551	27-Jul	15-Aug		19	
86	379552	27-Jul	15-Aug		19	
87	379553	27-Jul	15-Aug		19	
88	379554	27-Jul	15-Aug		19	
89	379555	27-Jul	15-Aug		19	
90	379556	27-Jul	15-Aug		19	
91	379557	27-Jul	15-Aug		19	
92	379558	27-Jul	15-Aug		19	
93	379559	27-Jul	15-Aug		19	
94	379560	27-Jul	15-Aug		19	
95	379561	27-Jul	15-Aug		19	
96	379562	27-Jul	15-Aug		19	
97	379563	27-Jul	15-Aug		19	
98	379564	27-Jul	15-Aug		19	
99	379565	27-Jul	15-Aug		19	
100	379566	27-Jul	15-Aug		19	
101	379567	27-Jul	15-Aug		19	
102	379568	27-Jul	15-Aug		19	
103	379569	27-Jul	15-Aug		19	
104	379570	27-Jul	15-Aug		19	
105	379571	27-Jul	15-Aug		19	
106	379572	28-Jul	15-Aug		18	
107	379573	28-Jul	15-Aug		18	
108	379574	28-Jul	15-Aug		18	
109	379575	28-Jul	15-Aug		18	
110	379576	28-Jul	15-Aug		18	
111	379577	28-Jul	15-Aug		18	
112	379578	28-Jul	15-Aug		18	
113	379579	28-Jul	15-Aug		18	
114	379580	28-Jul	15-Aug		18	
115	379581	28-Jul	15-Aug		18	
116	379582	28-Jul	15-Aug		18	
117	379598	28-Jul	15-Aug		18	
118	379599	28-Jul	15-Aug		18	
119	379600	28-Jul	15-Aug	D2	18	Found out of hole
120	379601	28-Jul	15-Aug		18	
121	379602	28-Jul	15-Aug		18	
122	379603	28-Jul	15-Aug		18	
123	379604	28-Jul	15-Aug		18	
124	379605	28-Jul	15-Aug		18	
125	379606	28-Jul	15-Aug		18	
126	379607	28-Jul	15-Aug		18	
127	379608	28-Jul	15-Aug		18	
128	379609	28-Jul	15-Aug		18	
129	379610	28-Jul	15-Aug		18	
130	379611	28-Jul	15-Aug		18	
131	379612	28-Jul	15-Aug		18	
132	379613	28-Jul	15-Aug	D2	18	Found out of hole
133	379614	28-Jul	15-Aug		18	

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Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
134	379615	28-Jul	15-Aug		18	
135	379616	28-Jul	15-Aug		18	
MW1	379443	25-Jul	14-Aug	m	20	
MW2	379444	25-Jul	14-Aug	m	20	
MW3	379445	25-Jul	14-Aug	m	20	
MW4	379446	25-Jul	14-Aug	m	20	
MW5	379447	25-Jul	14-Aug	m	20	
MW6	379448	25-Jul	14-Aug	m	20	
MW7	379449	25-Jul	14-Aug	m	20	
MW8	379450	25-Jul	14-Aug	m	20	
MW9	379451	25-Jul	14-Aug	m	20	
MW10	379452	25-Jul	14-Aug	m	20	
MW11	379453	25-Jul	14-Aug	m	20	
MW12	379454	25-Jul	14-Aug	m	20	
MW13	379455	25-Jul	14-Aug	m	20	
MW14	379456	25-Jul	14-Aug	m	20	
MW15	379457	25-Jul	14-Aug	m	20	
ME1	379583	28-Jul	15-Aug	m	18	
ME2	379584	28-Jul	15-Aug	m	18	
ME3	379585	28-Jul	15-Aug	m	18	
ME4	379586	28-Jul	15-Aug	m	18	
ME5	379587	28-Jul	15-Aug	m	18	
ME6	379588	28-Jul	15-Aug	m	18	
ME7	379589	28-Jul	15-Aug	m	18	
ME8	379590	28-Jul	15-Aug	m	18	
ME9	379591	28-Jul	15-Aug	m	18	
ME10	379592	28-Jul	15-Aug	m	18	
ME11	379593	28-Jul	15-Aug	m	18	
ME12	379594	28-Jul	15-Aug	m	18	
ME13	379595	28-Jul	15-Aug	m	18	
ME14	379596	28-Jul	15-Aug	m	18	
ME15	379597	28-Jul	15-Aug	m	18	
136	379617	29-Jul	17-Aug		19	
137	379618	29-Jul	17-Aug		19	
138	379619	29-Jul	17-Aug		19	
139	379620	29-Jul	17-Aug		19	
140	379621	29-Jul	17-Aug		19	
141	379622	29-Jul	17-Aug		19	
142	379623	29-Jul	17-Aug		19	
143	379624	29-Jul	17-Aug		19	
144	379625	29-Jul	17-Aug	D2	19	Found out of hole
145	379626	29-Jul	17-Aug		19	
146	379627	29-Jul	17-Aug		19	
147	379628	29-Jul	17-Aug		19	
148	379629	29-Jul	17-Aug		19	
149	379630	29-Jul	17-Aug		19	
150	379631	29-Jul	17-Aug		19	
151	379632	29-Jul	17-Aug		19	
152	379633	29-Jul	17-Aug		19	
153	379634	29-Jul	17-Aug		19	
154	379635	29-Jul	17-Aug		19	

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Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
155	379636	29-Jul	17-Aug		19	
156	379637	29-Jul	17-Aug		19	
157	379638	29-Jul	17-Aug		19	
158	379639	29-Jul	17-Aug		19	
159	379640	29-Jul	17-Aug		19	
160	379641	29-Jul	17-Aug		19	
161	379642	29-Jul	17-Aug		19	
162	379643	29-Jul	17-Aug		19	
163	379644	29-Jul	17-Aug		19	
164	379645	29-Jul	17-Aug		19	
165	379646	29-Jul	17-Aug		19	
166	379647	29-Jul	17-Aug		19	
167	379648	29-Jul	17-Aug		19	
168	379649	29-Jul	17-Aug		19	
169	379650	29-Jul	17-Aug		19	
170	379651	29-Jul	17-Aug		19	
171	379652	29-Jul	17-Aug		19	
172	379653	29-Jul	17-Aug		19	
173	379654	29-Jul	17-Aug		19	
174	379655	29-Jul	17-Aug		19	
175	379656	29-Jul	17-Aug		19	
176	379657	29-Jul	17-Aug		19	
177	379658	29-Jul	17-Aug		19	
178	379659	29-Jul	17-Aug		19	
179	379660	29-Jul	17-Aug		19	
180	379661	29-Jul	17-Aug		19	
181	379662	29-Jul	17-Aug		19	
182	379663	29-Jul	17-Aug		19	
183	379664	29-Jul	17-Aug		19	
184	379665	29-Jul	17-Aug		19	
185	379666	29-Jul	17-Aug		19	
186	379667	29-Jul	17-Aug		19	
187	379668	29-Jul	17-Aug		19	
188	379669	29-Jul	17-Aug		19	
189	379670	29-Jul	17-Aug		19	
190	379677	29-Jul	17-Aug		19	
191	379678	29-Jul	17-Aug		19	
192	379679	29-Jul	17-Aug		19	
193	379680	29-Jul	17-Aug		19	
194	379681	29-Jul	17-Aug		19	
195	379682	29-Jul	17-Aug		19	
196	379683	29-Jul	17-Aug		19	
	379688			JF		Jet Fuel B Ambient Sample
	379691			JF		Jet Fuel B Ambient Sample
	379701			JF		Jet Fuel B Ambient Sample
	379706			JF		Jet Fuel B Ambient Sample
	379693			JE		Jet Exhaust Sample
	379698			JE		Jet Exhaust Sample
	379699			JE		Jet Exhaust Sample
	379703			JE		Jet Exhaust Sample
	379684			b		

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Sample #	Module #	Date Ent.	Date Rec.	Notes	EXP	Observations
	379685			b		
	379687			b		
	379689			b		
	379690			b		
	379692			b		
	379694			b		
	379695			b		
	379696			b		
	379697			b		

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Waypoint File

SUMMARY INFO
196 Total Grid Samples
30 Total Models

UTM Zones 8 & 9
NAD27 Canada

Only samples 92, 93 and Model West are in Zone 8; All others in Zone 9!!

Sample #	Module #	Easting	Northing	Zone
01	379458	377594	7466263	9
02	379459	376861	7465566	9
03	379460	376083	7464956	9
04	379461	375287	7464350	9
05	379462	374501	7463724	9
06	379463	376790	7461654	9
07	379464	376446	7462590	9
08	379465	376108	7463530	9
09	379466	375790	7464394	9
10	379467	375459	7465339	9
11	379468	375157	7466196	9
12	379469	374801	7467134	9
13	379470	374432	7468197	9
14	379471	374168	7468916	9
15	379472	375982	7466845	9
16	379474	377204	7467812	9
17	379473	376481	7467256	9
18	379475	377914	7467335	9
19	379476	379116	7467872	9
20	379477	379868	7468794	9
21	379478	380760	7469253	9
22	379479	381410	7469427	9
23	379480	382589	7469753	9
24	379481	383643	7470199	9
25	379488	384770	7471197	9
26	379489	385705	7471807	9
27	379490	381592	7473177	9
28	379491	380535	7472737	9
29	379492	415876	7485028	9
30	379493	416227	7483254	9
31	379494	416348	7482132	9
32	379495	416986	7481104	9
33	379496	417100	7478980	9
34	379497	417640	7477737	9
35	379498	418264	7476886	9
36	379499	418103	7475663	9
37	379500	417853	7474938	9
38	379501	418162	7473317	9
39	379502	418556	7472302	9
40	379503	418151	7471482	9

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Sample #	Module #	Easting	Northing	Zone
41	379504	403274	7482180	9
42	379505	403064	7481648	9
43	379506	402970	7480136	9
44	379507	402880	7478759	9
45	379508	402829	7478019	9
46	379509	402890	7477257	9
47	379510	402708	7476177	9
48	379511	402697	7474872	9
49	379512	402340	7474003	9
50	379513	402666	7473001	9
51	379514	402783	7471716	9
52	379515	402299	7470963	9
53	379516	394165	7478689	9
54	379517	394755	7482527	9
55	379518	394941	7481190	9
56	379519	394643	7480224	9
57	379520	394430	7479546	9
58	379521	393868	7477756	9
59	379522	393489	7476529	9
60	379523	393235	7475738	9
61	379524	392923	7474773	9
62	379525	392716	7474080	9
63	379526	392214	7473121	9
64	379527	395173	7478663	9
65	379528	396130	7478627	9
66	379529	397322	7478679	9
67	379530	398136	7478607	9
68	379531	393147	7478720	9
69	379532	392167	7478756	9
70	379533	391192	7478793	9
71	379534	390102	7478825	9
72	379535	371849	7450788	9
73	379536	372975	7450858	9
74	379537	373917	7451011	9
75	379538	375037	7451196	9
76	379539	375919	7451274	9
77	379540	377078	7451008	9
78	379541	378257	7450757	9
79	379542	378882	7450721	9
80	379543	379880	7450676	9
81	379544	380806	7450619	9
82	379545	382054	7450545	9
83	379546	378627	7444880	9
84	379547	377809	7445010	9
85	379551	376531	7445578	9
86	379552	375371	7445392	9
87	379553	374427	7445534	9
88	379554	373355	7445694	9
89	379555	372361	7445879	9
90	379556	371176	7446293	9

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Sample #	Modula #	Easting	Northing	Zone
91	379557	370403	7446412	9
92	379558	630169	7446503	8
93	379559	629177	7446458	8
94	379560	379408	7472028	9
95	379561	380137	7471071	9
96	379562	380559	7470530	9
97	379563	381950	7468715	9
98	379564	382700	7467739	9
99	379565	383051	7467270	9
100	379566	383152	7474867	9
101	379567	378668	7471283	9
102	379568	378108	7470841	9
103	379569	377146	7470081	9
104	379570	376853	7469505	9
105	379571	375700	7468765	9
106	379572	375736	7471410	9
107	379573	372993	7462200	9
108	379574	371687	7461568	9
109	379575	370823	7460048	9
110	379576	373366	7465229	9
111	379577	372468	7464123	9
112	379578	371104	7463853	9
113	379579	371825	7471001	9
114	379580	372450	7469839	9
115	379581	371619	7468875	9
116	379582	371116	7469459	9
117	379598	434215	7438351	9
118	379599	435236	7439083	9
119	379600	435617	7439590	9
120	379601	436747	7440737	9
121	379602	436989	7441276	9
122	379603	437976	7441964	9
123	379604	438637	7442625	9
124	379605	438896	7443478	9
125	379606	440164	7444153	9
126	379607	433374	7437909	9
127	379608	431876	7437241	9
128	379609	431257	7436912	9
129	379610	430407	7436491	9
130	379611	429760	7436241	9
131	379612	428064	7435880	9
132	379613	427364	7435071	9
133	379614	426654	7434733	9
134	379615	425313	7434463	9
135	379616	422825	7432875	9
136	379617	433345	7439835	9
137	379618	433265	7440971	9
138	379619	432800	7441393	9
139	379620	432672	7442136	9
140	379621	432400	7443270	9

92	369796.5	7446512
93	368814.6	7446560

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Sample #	Module #	Easting	Northing	Zone
141	379622	431671	7443564	9
142	379623	431462	7443967	9
143	379624	430388	7445168	9
144	379625	430149	7446927	9
145	379626	429944	7447998	9
146	379627	429052	7449422	9
147	379628	428560	7449693	9
148	379629	427728	7450139	9
149	379630	427674	7450627	9
150	379631	427171	7452256	9
151	379632	427172	7452545	9
152	379633	426734	7453246	9
153	379634	426100	7454339	9
154	379635	425121	7455057	9
155	379636	425487	7456481	9
156	379637	429680	7451258	9
157	379638	430970	7451192	9
158	379639	432469	7451765	9
159	379640	432856	7452257	9
160	379641	433643	7452227	9
161	379642	435380	7452926	9
162	379643	436572	7453342	9
163	379644	437850	7454300	9
164	379645	426625	7448972	9
165	379646	417378	7470773	9
166	379647	417632	7469949	9
167	379648	417624	7468514	9
168	379649	417665	7467763	9
169	379650	417777	7466385	9
170	379651	418130	7464955	9
171	379652	418008	7464120	9
172	379653	417408	7463334	9
173	379654	417479	7461996	9
174	379655	417246	7460500	9
175	379656	416371	7458846	9
176	379657	416602	7458334	9
177	379658	417256	7457619	9
178	379659	416373	7456725	9
179	379660	415717	7456166	9
180	379661	418887	7456293	9
181	379662	422435	7457003	9
182	379663	427297	7456599	9
183	379664	428194	7457625	9
184	379665	429216	7459206	9
185	379666	429421	7459743	9
186	379667	430672	7460275	9
187	379668	431327	7461756	9
188	379669	432684	7461948	9
189	379670	432570	7463635	9
190	379677	432522	7464442	9

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Sample #	Module #	Easting	Northing	Zone
191	379678	433879	7463533	9
192	379679	434501	7464492	9
193	379680	435012	7465023	9
194	379681	425720	7448760	9
195	379682	425296	7447632	9
196	379683	422821	7448391	9
ME1	379583	418442	7444128	9
ME10	379592	418424	7444211	9
ME11	379593	418414	7444196	9
ME12	379594	418409	7444191	9
ME13	379595	418398	7444178	9
ME14	379596	418392	7444167	9
ME15	379597	418391	7444157	9
ME2	379584	418463	7444147	9
ME3	379585	418464	7444152	9
ME4	379586	418466	7444168	9
ME5	379587	418471	7444180	9
ME6	379588	418465	7444191	9
ME7	379589	418458	7444210	9
ME8	379590	418439	7444220	9
ME9	379591	418429	7444219	9
MW1	379443	613997	7465703	8
MW10	379452	614039	7465705	8
MW11	379453	614026	7465711	8
MW12	379454	614014	7465721	8
MW13	379455	614015	7465725	8
MW14	379456	614011	7465732	8
MW15	379457	614000	7465728	8
MW2	379444	614002	7465698	8
MW3	379445	614009	7465692	8
MW4	379446	614015	7465677	8
MW5	379447	614015	7465673	8
MW6	379448	614017	7465669	8
MW7	379449	614026	7465658	8
MW8	379450	614042	7465663	8
MW9	379451	614048	7465673	8
Model West		614040	7465689	8
Model East		418418	7444162	9

Model West 355594.9 7467158

MAPS
Grandview Hills Prospect
Northwest Territories, Canada
Gas-like Signature