APPENDIX H

NOVA SCOTIA MUSEUM ENVIRONMENTAL SCREENING

NOVA SCOTIA
Tourism and Culture

Heritage Division

Memorandum

TO: Peter Oram

FROM: Robert Ogilvie DATE: October 14, 2003

RE: **Environmental Screening 03-09-12**
Stellarton

Further to your request of by October 13, 2003, staff of the Heritage Division have reviewed their files for reference to the presence of known heritage resources in the study area. Please be aware that our information is not comprehensive, in that it is incomplete and of varying degrees of accuracy with respect to the precise location and condition of heritage resources.

Cultural Heritage
Archaeology
Two known recorded archaeological sites are located with in the study area. Both are related to past industrial use of the area. One site is the Albion Iron Foundry (BjCp-05) and the other is the Stellarton Pump House (BjCp-06). High potential exists within the study area for additional early historical industrial sites: e.g. 19th century coal mine related.

High potential also exists along major waterways within the study area for Pre-Contact sites as numerous recorded Pre-Contact sites in the Pictou Harbour/East River of Pictou area, just to the north of the study area

Natural Heritage
Botany
The following plants have been found in the study area or in similar habitats adjacent to the area under consideration. All have a provincial status ranking of at least YELLOW.

Yellow Lady's-Slipper *Cypripedium calceolus* var. *pubescens*
Water-pimpernel or Brookweed *Samolus floribundus*
Wild Lily, Yellow Lily or Canada Lily *Lilium canadense*
Salix pedicellaris
Elymus wiegandii (RED)
Dwarf Clearweed *Pilea pumila*
Wood Nettle *Laportea canadensis*
Dicanthelium linearifolium
Blood-milkwort *Polygala sanguinea*

Zoology

There are no records of species of concern in the immediate study area with the exception of the Wood turtle (*Clemmys insculpta*). There are, however, records-of-use for associated watersheds by fish species of note, specifically Atlantic Salmon (*Salmo salar*).

There are nearby records of Blue-spotted Salamanders (*Ambystoma laterale*). The area supports locally abundant summer populations of Little Brown Bats (*Myotis lucifugus*), although it is not entirely clear if there are hibernacula within the study area.

As well, there are confirmed breeding records of the following bird species of concern:

Osprey *Pandion haliaetus*
Northern Oriole *Icterus galbula*
Northern Mockingbird *Mimus polyglottos*
Eastern Kingbird *Tyrannus tyrannus*
Piping Plover *Charadrius melodus*
Common Loon *Gavia immer*
possible Common terns *Sterna hirundo*

We have additional records of a suite of estuarine and freshwater vertebrate and invertebrate species within the area, including use of these waters by migratory and, in some cases, infrequent species. If these type of data are required, they could be assembled.

Ecological Reserves or Candidates

There are no identified ecological reserves or candidate reserves in the area.

I have attached an invoice for the staff time spent reviewing our records and compiling this response.

If you have any questions, please contact me at 424-6475.

APPENDIX I

DEPARTMENT OF NATURAL RESOURCES TERRESTRIAL SURVEY

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NOVA SCOTIA
Natural Resources

ince Street, 1st Floor
Arlington Street Entrance
Truro, NS B2N 1G6
Tel (902) 893-6353
Fax (902) 893-5613
E Mail archibdr@gov.ns.ca

TO: Gary Westoll, Regional Resource Manager

FROM: Doug Archibald, Regional Biologist.

DATE: September 10, 2003

RE: Habitat Investigation : Area of the Proposed Extension of Stellarton Open Pit Coal Mine East of MacGregor Avenue.

On Sept. 10 I visited the site of the proposed extension of the Stellarton Open Pit Coal Mine, accompanied by Don Weir, regional geologist. This is the area east of the current mine and immediately east of MacGregor Avenue. The purpose of the visit was to determine if an in depth vegetation survey was necessary prior to expanding the current operations.
In summary it is my opinion that the habitat evaluations, in particular the vegetation surveys, completed for the 1995 Environmental Assessment Report are representative of the area, that it is unlikely that any species of concern exists on the site and that a further vegetation assessment in not necessary.

Site Survey Methodology:
The boundaries of the proposed mine expansion *(approx. 40 ha)* were drawn on an aerial photo *(fig.1)* and the area divided into 7 sections based on use, vegetation and geography. Each site was then investigated noting vegetation, wildlife sign, current and past use, watercourses and wetlands. Representative digital photos were taken in sections 1,2,4,5,7.
Vegetation and wildlife species *(actual or sign)* observed were not any different then those noted in the 1995 Environmental Assessment Report *(section 6.6, pg74)* submitted by Pioneer Coal, as per the direction of the Dept of Environment, and are representative of early secessional species.
In general the majority of the area has been severely disturbed over the last 150

years. Coal mining, forestry, small scale farming, habitation, fires, rail lines, power transmission poles and road building have left little if any of the site undisturbed. In the early to mid 1970`s much of the area was levelled , contoured and seeded through a rehabilitation project.

Site1:

This 5 ha area has been contoured and seeded with clover and is basically open field. Poplar and pincherry are evident with the occasional red pine. Golden rod, Queen Annes Lace, hawkweed and asters are common. The exposed soil is mainly shale and tailings from the dumps of past coal mines.

Site 2:

A 3 ha patch of hardwood averaging 40 years of age bordering a cluster of homes. Dominant species is poplar however cherries are common and oak is found closer to the homes. Areas of subsidence are common and trenching is evident. Broken shale and coal fragments are evident from past mining operations. Garbage is distributed across the site, particularly in sinkholes.

Site 3:

This area of approx 4 ha consists of a cluster of 6 homes on private land. Most are older and date back to mining days. Area is obviously disturbed and vegetation is consistent with such a residential area. It is noteworthy that subsidence due to underground mine workings is common here and that in December of 2002 a shaft opened up immediately next to a garage. The access road is paved and homes are serviced with water and sewer. Oaks are present on site and age 70 to 80 years.

Site 4:

This 8 ha area has a dominant poplar canopy of age of 35 to 40 years. Coal brook lies along the eastern boundary and here the land slopes steeply (45 degree +) to a flood plain with richer soils. Here red maple, oak, hawthorn, mtn ash and the occasional black cherry were evident but there were not any plant species of concern noted. Aside from sites 3 and 6 where homes are present this area has the least undisturbed soils, although subsidence and trenching are still evident. Sweet fern, bracken fern and blueberries are common ground cover on the upper flats. Deer tracks and scat were evident and fox have been reported in this and area 7 denning under slabs of concrete.

Site 5:

Site 5 (4ha) is similar to site 1 although dumping and ATV trails are more evident.

Site 6:

Three homes are located on this 1 ha site although only one is in use. At least one of these homes is present in a 1950 photo. Area is similar to site 3.

Site 7:

This is the largest of the sites (approx 15 ha) and is characterized by early secessional vegetation species. Age since the last disturbance varies from 40 years to present. An aerial photo from the 1950s shows that most of this area was heavily industrialized with a rail siding, coal mine facilities and various buildings

and roads. Currently there is a small isolated pond (.25 ha) dominated by cattails. The pond is not evident in the photo and thus must be the result of land contouring during site rehabilitation. The pond is no doubt used by frogs and other herps however none were evident. Raccoon tracks were noted along the muddy shore.


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1.
MAC GREGOR AVE.

APPENDIX J

CMM FIRST NATIONS SCREENING

The Confederacy of Mainland Mi'kmaq

Member Mi'kmaw Bands
Afton • Annapolis Valley • Bear River • Glooscap • Millbrook • Pictou Landing

Main Office:
57 Martin Crescent, Millbrook Mi'kmaw Community
PO Box 1590 Truro, Nova Scotia Canada B2N 5V3
Tel (902) 895-6385 Fax (902) 893-1520

Sub-Offices: (Halifax)
Native Education Counselling Unit (902) 494-8863
Hospital Interpreters Liaison Program (902) 453-9358
Website Address: www.cmmns.com

December 12, 2003

MGI Dartmouth
DEC 30 2003
RECEIVED

Peter Oram
MGI Limited
31 Gloster Court
Dartmouth, NS
B3B 1X9

Re: Stellarton Surface Coal Mine – Extension East of MacGregor Avenue

Dear Mr. Oram:

After reviewing the provided documentation, The Confederacy of Mainland Mi'kmaq (CMM) feels that the project does not require further assessment to determine Mi'kmaq interests due to the fact that most, if not the entire site, has been extensively disturbed in the past.

Please find enclosed an invoice for $700 for research of this site. Should you have any further comments or questions regarding this matter, please do not hesitate to contact Michael Cox either via phone at (902) 895-6385 ext 237 or via email at environment@cmmns.com.

Yours in Recognition
Of Mi'kmaw Title,

Donald M. Julien
Executive Director

DMJ/eem

Cc. Michael Cox, Director of Lands, Environment and Natural Resources

Enclosure

APPENDIX K

COAL REACTIVITY ANALYSIS

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel: (303) 279-4501
Fax: (303) 278-1528

April 20, 2000

FEDERAL EXPRESS TRANSMITTAL

Mr. Paul White
Pioneer Coal Ltd.
1535 Drummond Road
Westville, Nova Scotia
Canada B0K 2A0

Re: Analyses and Reactivity of Pioneer Coal Sample
Hazen Project 9653

Dear Mr. White.

INTRODUCTION AND SUMMARY

Pioneer Cape Ltd. (Pioneer) authorized Hazen Research, Inc. to conduct tests on one submitted coal sample to measure its relative reactivity as determined by the oxygen uptake test in air and the self-heating test in moist oxygen. Pioneer also asked Hazen to obtain ultimate, proximate, British thermal unit (Btu), and sulfur-form values.

The coal sample did not evolve gases (methane or other low-molecular weight hydrocarbons) during the oxygen uptake tests, and the sample exhibited slow oxygen absorption. The calculated first-order oxygen adsorption rates were relatively low, between 0.0018 and 0.002 $hour^{-1}$ after 24 hours. A reference sample of reactive subbituminous coal obtained from the Powder River Basin (PRB) in Wyoming had a higher reaction rate of 0.0040 $hour^{-1}$, twice as high as the Pioneer sample.

The self-heating tests showed that the coal sample had very little tendency to self-heat at 74°C in the presence of moist oxygen.

The ultimate, proximate, and Btu analyses were consistent with high-volatile A bituminous coals. The sulfur content of the coal sample was 1.26% on a dry basis.

The coal sample did not exhibit significant self-heating at its as-received moisture content of 8.81%. The oxygen uptake tests indicated a slow rate of oxygen uptake for the coal sample.

TEST PROCEDURE

OXYGEN UPTAKE TESTS

Hazen has adapted the sealed flask test procedure developed by the U.S. Bureau of Mines (USBM)[1] to provide a relative indication of low-temperature reactivity of raw or upgraded coals. In Hazen's procedure, samples are tested without drying, rather than having been dried and crushed prior to testing, as in the USBM procedure. Test results are reported in terms of a first-order reaction rate constant.

The oxygen uptake test provides an indication of oxidation and/or oxygen adsorption at ambient temperature. Neither the oxygen uptake nor the self-heating test should be used to directly predict spontaneous combustion tendencies during storage of large bulk samples.

Samples for oxygen uptake tests were sealed in one-liter stainless steel bombs containing an air atmosphere. A ratio of 100 grams of as-received sample to one liter of air was chosen on the basis of USBM work and the anticipated reactivity of the range of samples tested. The pressure in each bomb was adjusted to sea-level pressure (760 millimeters (mm) of mercury absolute) by injecting air from a large syringe through a septum fitted into the top of the bomb. This adjustment allowed each test to be conducted under standard conditions, without variations due to local atmospheric pressure. Pressure measurement was made via a transducer, which was fitted into the bomb lid. The transducer measures from 0 to 776 mm mercury absolute, with an output from 0 to 100 millivolts (mv). After a bomb containing the desired weight of coal was sealed, air was injected until a pressure transducer reading of about 100 mv was obtained. Tests were performed in a water bath maintained at 24°C (75°F). Pressure transducer millivolt readings were converted to pressure readings expressed in millimeters of mercury corrected to a constant temperature of 23°C. Prior to starting tests with coal, each bomb lid and all fittings were checked for leaks by pumping each empty bomb to about 760 mm mercury absolute pressure to demonstrate no loss of pressure for about 24 hours. The oxygen uptake tests on the as-received raw coal samples were run in triplicate.

Routine measurements taken during the tests included bath temperature, transducer pressure (millivolt reading), and elapsed time for each flask. Typically, after the first day of each test, readings were obtained about once or twice each day. At the end of the test, the gases above the coal sample were analyzed for oxygen, nitrogen, hydrogen, carbon monoxide, carbon dioxide, methane, ethane, and acetylene.

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[1] Miron, Yael, Smith, A. C., and Lazzara, C. P. (1990), Sealed Flask Test for Evaluating the Self-heating Tendencies of Coals, U.S. Bureau of Mines, Report of Investigations RI 9330.

Assuming that all pressure depletion was a result of oxygen uptake by the coal, the total pressure remaining in the flask completely depleted of oxygen would be about 601 mm mercury absolute. This assumes no byproduct gas formation (CO or CO_2, for example). Generally, CO_2 would be expected to represent byproduct gas generated or released in greatest amounts at ambient temperature. Based on USBM data, coals that have been dried evolve much less CO_2 than fresh, raw coal samples. In any event, the byproduct gas formation was expected to be minor relative to oxygen uptake.

The rate of oxygen uptake is a function of the type of reaction and the rate of reaction. A rate constant is applicable to specific test conditions (temperature, coal-to-air ratio, particle size, etc.), as shown below:

$$\frac{-dC}{dt} = kC^n$$

where C is the concentration of oxygen, k the rate constant, t the time, and n the order of the reaction.

By placing this equation in its logarithmic form, we obtain:

$$-\log\,(dC/dt) = n\,\log\,C + \log\,k$$

The slope of the plot of dC/dt versus C is the order of the reaction, n.

By rearranging and integrating the original differential equation from t_1 to t_2, we obtain the following for a first-order reaction (n = 1):

$$\ln\,(C_2/C_1) = -k\,(t_2 - t_1)$$

where:

$$C_1 = (760 - 600.8)/760 = 0.2095\ atm$$

$$C_2 = (P_2 - 600.8)/760$$

and where: C_1 = Oxygen concentration (or oxygen partial pressure remaining) at t_1, atm
C_2 = Oxygen concentration (or oxygen partial pressure remaining) at t_2, atm
P_2 = Absolute pressure in mm Hg, at elapsed time, t_2
t_2 = Elapsed time, hours
k = Rate constant, $hour^{-1}$

First-order reactions also follow the general guideline that equal times are required to reduce, by the same relative amount, the value of C starting from any initial value.

The rate constant is used to compare the relative differences in oxygen uptake from one sample to another. Generally, for similar types of coal, higher rate constants indicate greater reactivity. Rate constants can vary by as much as two orders of magnitude, depending on the reactivity of the sample, storage conditions (previous exposure to oxygen), particle size, temperature, etc.

SELF-HEATING TESTS

The self-heating test used at Hazen provides a relative comparison of the self-heating tendencies of coarse coal samples by subjecting the samples to worst-case conditions in a controlled environment. By elevating the temperature of the samples to approximately 74°C and then passing warm, moist oxygen at approximately 74°C through the samples, conditions conducive to self-heating are produced. The mechanism of self-heating has two steps: 1) moisture adsorption on the surface, which raises the temperature due to the release of the latent heat of condensation, and 2) if sufficient moisture condenses on the surface, it will raise the temperature of the coal enough to self-heat by adsorption and chemical reaction of the oxygen with the coal. It should be noted that the test is intended only to provide a relative comparison of the samples under similar conditions, not to predict the behavior of the products in storage or in transport. Because exposure of samples to air or oxygen prior to testing can significantly affect test results by altering the surface reactivity, consideration should be given to the sampling and storage methods employed.

The self-heating reactor consists of a stainless steel chamber with a false bottom. A fine stainless steel screen supports a sand bed that evenly disperses the gas entering from the bottom through the coal bed above. A thermocouple located in the side of the reactor extends into the center of the coal bed. A second thermocouple extends vertically from the lid of the reactor to near the bottom of the coal bed. Oxygen is passed through a water bubbler located inside the oven, so that the inlet gas is preheated and saturated with moisture at the reactor inlet temperature.

To run a test, the reactor (containing a three-kilogram sample) and gas saturator were first purged with nitrogen and preheated overnight to approximately 165°F (74°C) in a closed oven. Oxygen flow was then started at 1.5 liters per minute. Gas exiting the reactor passed through a condenser to remove moisture and then into a gas analysis train, which analyzed for hydrogen, oxygen, nitrogen, carbon monoxide, carbon dioxide, methane, ethane, and acetylene. The temperature of

the coal inside the reactor and the composition of the gas leaving the reactor were monitored throughout the test. The tests were continued for approximately five hours, or until the temperature of the coal bed exceeded 150°C. At the conclusion of the test, the flow of moist oxygen was stopped, and dry nitrogen was introduced while the reactor cooled.

ULTIMATE, PROXIMATE, BTU, AND SULFUR FORMS

These standard tests were run according to ASTM Procedures D-3176 and D-3172.

TEST RESULTS

OXYGEN UPTAKE TESTS

Figures 1A through 1C (enclosed) show the pressure history of the oxygen uptake tests for the coal sample run in triplicate. Figure 2 (enclosed) shows the results for the reactive reference PRB sample.

Table 1 shows the results of the gas analyses. A sample of gas was removed from the head space of each of the three Pioneer sample flasks and from one reference PRB coal sample flask using a gas-tight syringe.

Table 1. Pioneer Coal Ltd. Oxygen Uptake Gas Chromatograph Data

Sample	Volume % at Conclusion of Test						
	H_2	O_2	N_2	CH_4	CO	CO_2	% of Starting O_2
Pioneer Flask 1	0.00	14.47	84.20	0.00	0.00	1.10	69
Pioneer Flask 3	0.00	14.26	83.83	0.00	0.00	1.04	68
Pioneer Flask 4	0.00	14.30	83.75	0.00	0.00	1.15	68
PRB Coal (Ref.)	0.00	0.20	98.53	0.00	0.00	1.67	1

The oxygen contents of the atmospheres above the triplicate Pioneer samples after nearly 120 hours were very similar, at 14%. The reaction rate calculated from these test data assumes that the rate

of oxygen absorption is a first-order reaction with respect to oxygen concentration. The oxygen concentration above the more reactive PRB coal sample was 0.2%, about 1% of the starting value of 20.95%.

SELF-HEATING TESTS

The self-heating test with the Pioneer coal sample was uneventful, as shown in Figure 3 (enclosed). The temperature of the bed never rose above the ±1°C error band of the starting temperature. When the flow of moist oxygen was started, the lower-bed temperature was 75°C. During the next hour, this temperature briefly rose to 80°C. After two hours, this temperature returned to the starting temperature of 75°C. No carbon monoxide and only trace amounts of carbon dioxide were detected, at 0.040 to 0.055%.

ULTIMATE, PROXIMATE, AND BTU ANALYSES

Table 2 (enclosed) shows the results of the ultimate, proximate, and Btu analyses.

The Pioneer coal can be classified as high-volatile A bituminous coal, according to the 1994 Annual Book of ASTM Standards, Volume 5 D 388. This classification is based on a fixed-carbon content of less than 69%, volatile content of over 31%, and HHV of over 14,000 Btu/lb (all on a dry, mineral-free basis).[2]

If you have any questions concerning this report, please call Mr. Rick Kenney or me.

Sincerely,

Robert A. Reeves

Robert A. Reeves, P.E.
Project Manager

RAR:wk
Enclosures

xc: Rick Kenney, Hazen

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[2] Perry, R. H. and Green, D. W., loc. cit., p. 27-4.

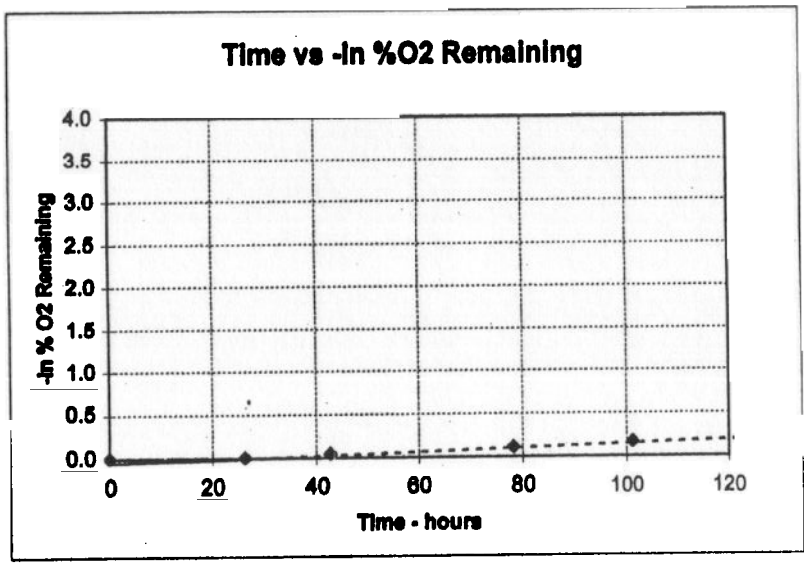
1-Liter Sealed Flask Oxygen Uptake Experiment Data Sheet

Sample Description	Pioneer Coal
Sample Weight	100.1 grams
Overpressure Gas	Air
Flask ID	1

Initial Period	24	Hours
Reference Temp	23	deg Celsius
Sea Level Pressure	760	mm Hg
mV @ Sea Level Pressure	98	mV

Parameter	First 24 Hours	After 24 Hours
Reaction Rate k, per hour:	0.0013	0.0020
Correlation Coefficient:	0.2343	0.9994
Number of Data Points:	3	8

Test Data		
Time	Temp	mV
3/29/00 12:45	24	99.0
3/29/00 15:15	24	101.4
3/30/00 7:30	24	99.4
3/30/00 15:00	24	98.9
3/31/00 7:30	24	98.1
4/1/00 19:00	24	96.8
4/2/00 18:00	24	95.8
4/3/00 15:30	24	95.1
4/4/00 7:00	24	94.6
4/4/00 15:00	24	94.4
4/5/00 12:30	24	93.7



Note: Reaction rates corrected to standard 100 gram sample size

Figure 1A. Pioneer Coal Sample (First Run)

Hazen Research, Inc.

Hazen Research, Inc.

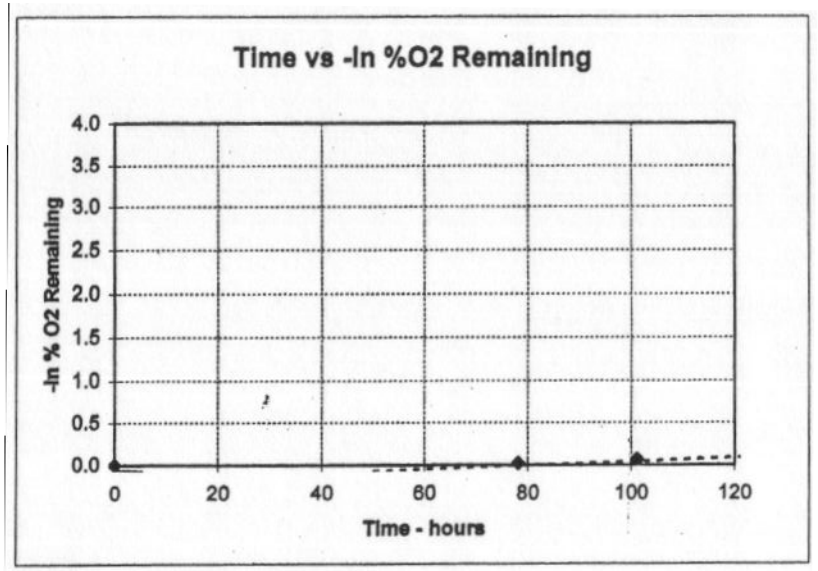
1-Liter Sealed Flask Oxygen Uptake Experiment Data Sheet

Sample Description	Pioneer Coal
Sample Weight	100.1 grams
Overpressure Gas	Air
Flask ID	3

Initial Period	24	Hours
Reference Temp	23	deg Celsius
Sea Level Pressure	760	mm Hg
mV @ Sea Level Pressure	98	mV

Parameter	First 24 Hours	After 24 Hours
Reaction Rate k, per hour:	-0.0032	0.0020
Correlation Coefficient:	-0.4472	0.9991
Number of Data Points:	3	8

Test Data		
Time	Temp	mV
3/29/00 12:50	24	98.6
3/29/00 15:15	24	101.6
3/30/00 7:30	24	101.0
3/30/00 15:00	24	100.6
3/31/00 7:30	24	99.7
4/1/00 19:00	24	98.3
4/2/00 18:00	24	97.3
4/3/00 15:30	24	96.5
4/4/00 7:00	24	96.0
4/4/00 15:00	24	95.8
4/5/00 12:30	24	95.1



Note: Reaction rates corrected to standard 100 gram sample size

Figure 1B. Pioneer Coal Sample (Second Run)

Hazen Research, Inc.

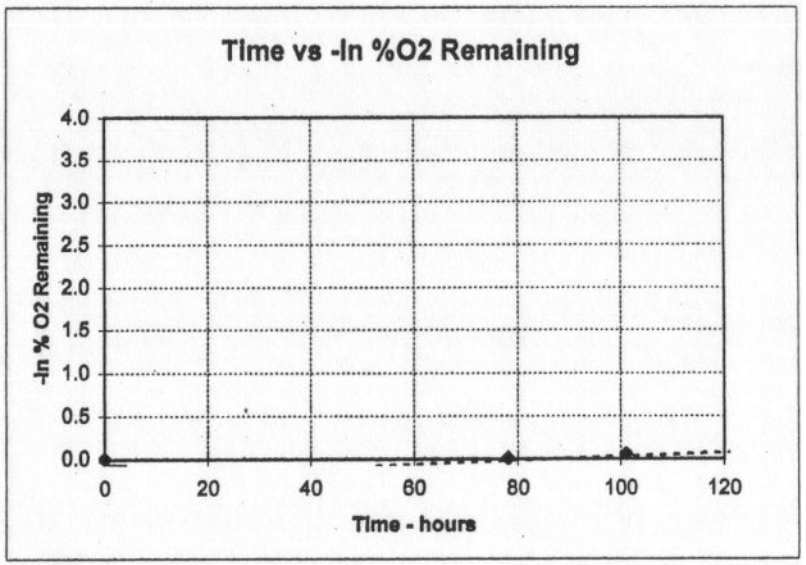
1-Liter Sealed Flask Oxygen Uptake Experiment Data Sheet

Sample Description	Pioneer Coal
Sample Weight	100.04 grams
Overpressure Gas	Air
Flask ID	4

Initial Period	24	Hours
Reference Temp	23	deg Celsius
Sea Level Pressure	760	mm Hg
mV @ Sea Level Pressure	98	mV

Parameter	First 24 Hours	After 24 Hours
Reaction Rate k, per hour:	-0.0032	0.0018
Correlation Coefficient:	-0.4277	0.9990
Number of Data Points:	3	8

Test Data		
Time	Temp	mV
3/29/00 12:55	24	99.0
3/29/00 15:15	24	102.2
3/30/00 7:30	24	101.5
3/30/00 15:00	24	101.0
3/31/00 7:30	24	100.3
4/1/00 19:00	24	98.9
4/2/00 18:00	24	97.9
4/3/00 15:30	24	97.1
4/4/00 7:00	24	96.7
4/4/00 15:00	24	96.5
4/5/00 12:30	24	95.8



Note: Reaction rates corrected to standard 100 gram sample size

Figure 1C. Pioneer Coal Sample (Third Run)

Hazen Research, Inc.

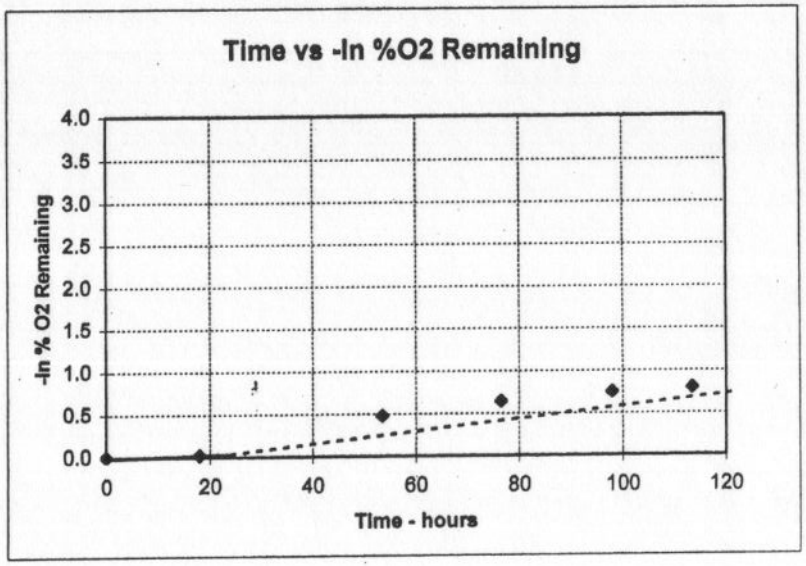
1-Liter Sealed Flask Oxygen Uptake Experiment Data Sheet

Sample Description	Powder River Basin Subbituminous Coal
Sample Weight	100.00 grams
Overpressure Gas	Air
Flask ID	5

Initial Period	24	Hours
Reference Temp	23	deg Celsius
Sea Level Pressure	760	mm Hg
mV @ Sea Level Pressure	98	mV

Parameter	First 24 Hours	After 24 Hours
Reaction Rate k, per hour:	0.0023	0.0041
Correlation Coefficient:	0.6720	0.9583
Number of Data Points:	3	6

Test Data		
Time	Temp	mV
3/30/00 13:30	24	99.8
3/30/00 15:00	24	100.8
3/31/00 7:30	24	99.4
4/1/00 19:00	24	91.9
4/2/00 18:00	24	89.9
4/3/00 15:30	24	88.8
4/4/00 7:00	24	88.3
4/4/00 15:00	24	88.2
4/5/00 12:30	24	87.9



Note: Reaction rates corrected to standard 100 gram sample size

Figure 2. Powder River Basin Subbituminous Coal (Reference for Reactive Coals)

Hazen Research, Inc.

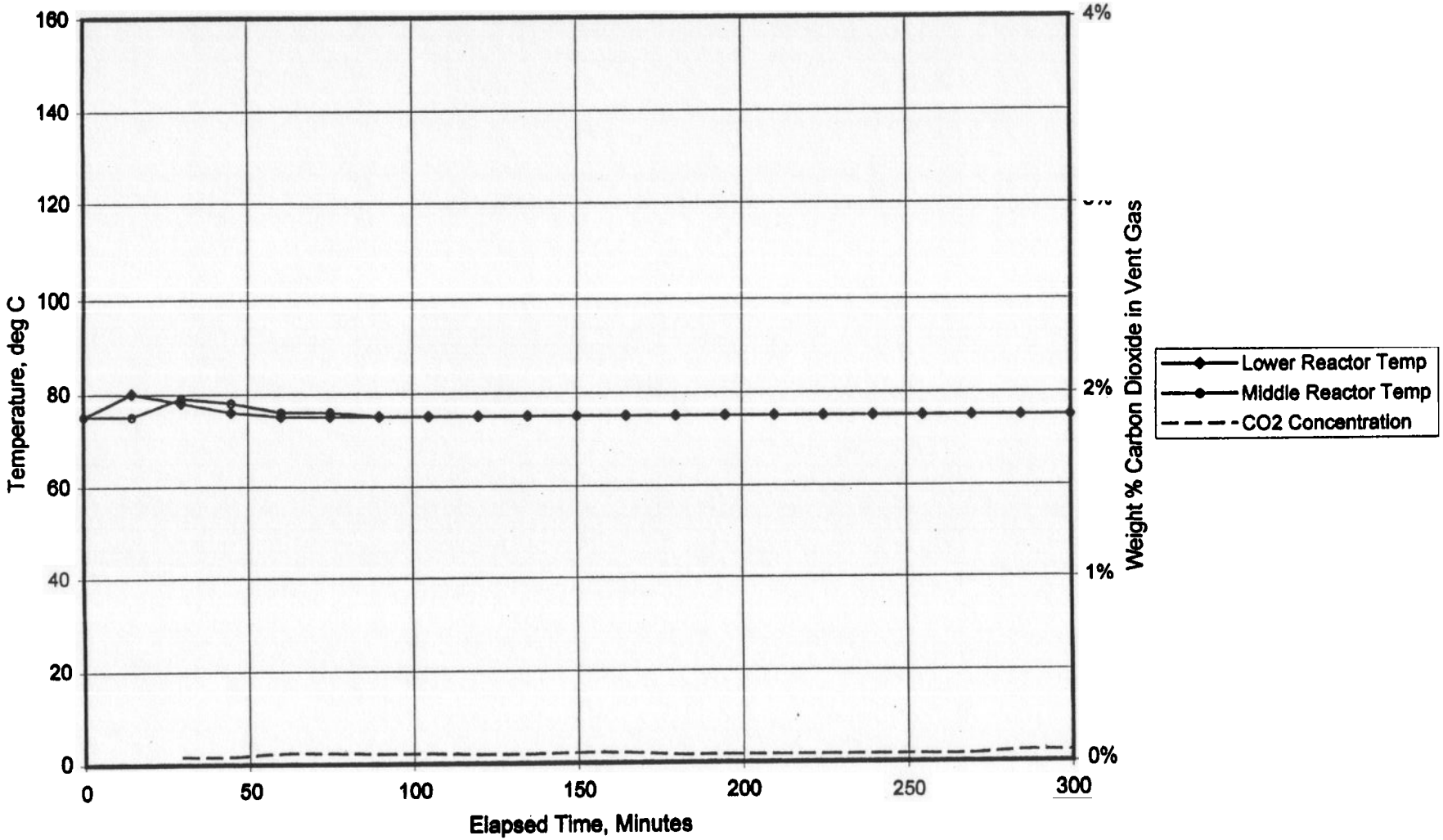


Figure 3. Self Heating Test Results - Pioneer Coal
HRI 50057

Table 2. Ultimate, Proximate, Btu, and Sulfur Forms Analyses

Parameter	Pioneer (50057-1)
Moisture, Weight %	8.81
Proximate (Dry Basis), Weight %	
Ash	23.36
Volatile	24.51
Fixed Carbon	52.13
Btu As-received, Btu/lb	10,727
Btu (MAF), Btu/lb	13,996
Ultimate (Dry Basis), Weight %	
Carbon	62.53
Hydrogen	2.69
Nitrogen	1.66
Sulfur	1.26
Ash	23.36
Oxygen (by Difference)	8.50
Sulfur Forms (Dry Basis), as S, %	
Sulfate	0.03
Pyritic	0.23
Organic	1.00