APPENDIX A

REPORTS FOR MPCA WATER QUALITY ANALYSES OF BARTON PLANT SCRUBBER EFFLUENT

238202

RECEIVED
SEP 11 1987
BARR ENGR. CO.

Minnesota Pollution Control Agency

September 10, 1987

Mr. Gary B. Sauer
President
Barton Sand & Gravel Company
10633 89th Avenue North
Osseo, Minnesota 55369

Dear Mr. Sauer:

Re: Results of Testing of New Scandia Wet Scrubber Effluent

I am enclosing the water quality analysis results for the two samples taken by Minnesota Pollution Control Agency (MPCA) staff on the wet scrubber discharge at your New Scandia operation on June 30, 1987. The following is a brief discussion of these results:

Volatile hydrocarbons: The only volatile hydrocarbon compound detected in either sample was benzene, at 0.7 ug/L, in the scrubber effluent sample. This concentration was just above the detection limit (0.50 ug/L) and substantially below our concern level for drinking water, 12 ug/L. The MPCA staff has determined, based upon these results and knowledge of wet scrubbers, that volatile hydrocarbons from the wet scrubber discharge at New Scandia do not pose a ground water contamination threat.

Remaining parameters: Total suspended solids (TSS) levels were very high in both samples. These data are perhaps most useful in examining the metals and polyaromatic hydrocarbon (PAH) results. Both the metals and PAH results are elevated. Because both metals and PAHs sorb to particulate matter, however, the concentrations of metals and PAHs entering the ground water in discharge from the wet scrubber ponds may be significantly lower than those reported in these two samples. The MPCA staff will be examining the results of the ground water study to be conducted by Barton in order to help determine the possible impacts of the wet scrubber discharge on metals and PAH levels in ground water at the site.

Phone:_____
520 Lafayette Road, St. Paul, Minnesota 55155
Regional Offices • Duluth/Brainerd/Detroit Lakes/Marshall/Rochester
Equal Opportunity Employer

If you have any questions on these results, please contact Jim Strudell at (612)296-7238.

Sincerely,

Douglas A. Hall
Supervisor, Permits Unit
Regulatory Compliance Section
Division of Water Quality

DAH/JDS:cdr

Enclosure: Copy of Lab Sheet Results for Sample Nos. 160022 to 160029

cc: Tim Brown
Karen Nelson
Dennis O'Donnell, Washington County
Howard Hawkinson, New Scandia Township
Senator Gary W. Laidig

MINNESOTA DEPARTMENT OF HEALTH
CHEMICAL LABORATORIES

Budget No. RCA-21C

Water Quality
Program Development
JUL 15 1987

Date Collected 6/30/87

ORGANIC CHEMISTRY UNIT

Collected By J. Strudell, L. Johnson

WATER ANALYSES ONLY

Date Received 6-30-87

Report To Jim Strudell

Sample Number		Field Number	Sample Location and/or Description (Town, County, etc.)	Containers: Type and Number
160024	a	NS-1	North scrubber water pond	4 vials
160025	b	NS-2	Wet scrubber effluent	4 vials
160026	c		Blank	3 vials
	d			
	e			

This Line for LAB SAMPLE NUMBER ONLY.		a 160024	b 160025	c 160026	d	e
Chlorophyll A	450					
Volatile Hydrocarbons	465					
Purgeable Aromatics	462					
Purgeable Halogenated	464					
Gasoline/Fuel Oil	463					
PAH	470					
Phenolic Compounds	480					
Phthalate Esters	490					
PCB's	420					
Herbicides	425					
2,4-D						
2,4,5-TP (Silvex)						
2,4,5-T						
Pesticides	421					
Lindane						
Methoxychlor						
Toxaphene						
Endrin						
Other Pesticides						
FIELD BLANK #: 160026						

COMPLETED
JUL 14 1987
CHEMICAL LABS

V3 MINNESOTA DEPT OF HEALTH - CHEMICAL LABORATORY 1

VOLATILE HYDROCARBONS (code 465)

10.9.86

Compound	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
HALOGENATED (code 464)		
Chloromethane	NQ	
Dichlorodifluoromethane	NQ	
Vinyl Chloride	NQ	
Bromomethane	NQ	
Chloroethane	NQ	
Dichlorofluoromethane	NQ	
Methylene Chloride	< 1.0	
Trichlorofluoromethane	< 0.50	
1,1,Dichloroethene	< 0.20	
Allyl Chloride	< 0.50	
1,1,Dichloroethane	< 0.20	
c-1,2 Dichloroethene	< 0.20	
t-1,2 Dichloroethene	< 0.20	
Chloroform	< 0.20	
112 Trichlorotrifluoroethane	< 0.50	
1,2, Dichloroethane	< 0.20	
Dibromomethane	< 1.0	
1,1,1, Trichloroethane	< 0.20	
Carbon Tetrachloride	< 0.20	
Bromodichloromethane	< 0.50	
Dichloroacetonitrile	NQ	
2,3 Dichloro-1-propene	< 0.20	
1,2 Dichloropropane	< 0.20	
1,1 Dichloro-1-propene	< 0.20	
t-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethene	< 0.20	
1,3 Dichloropropane	NQ	
Chlorodibromomethane	< 0.50	
c-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethane	< 0.20	
1,2 Dibromoethane	< 0.50	
2-Chloroethylvinyl ether	NQ	
Bromoform	< 1.0	
1,1,1,2 Tetrachloroethane	< 0.20	
1,2,3 Trichloropropane	NQ	
1,1,2,2 Tetrachloroethene	< 2.0	
1,1,2,2 Tetrachloroethane	< 2.0	
Pentachloroethane	NQ	
Chlorobenzene	< 0.50	
1,3 Dichlorobenzene	< 1.0	
1,2 Dichlorobenzene	< 1.0	
1,4 Dichlorobenzene	< 1.0	
NON-HALOGENATED (code 462)		
Acetone	< 20.0	
Tetrahydrofuran	< 10.0	
Ethyl Ether	< 1.0	
Methyl Ethyl Ketone	< 10.0	
Benzene	< 0.50	
Methyl Isobutyl Ketone	< 2.0	
Toluene	< 0.50	
Ethyl Benzene	< 0.50	
Cumene	< 1.0	
m Xylene	< 0.50	
p & o Xylene	< 0.50	

LAB SAMPLE#: 160024

FIELD BLANK #: 160026

DATE SAMPLED: 06/30/87
ANALYZED: 07/06/87
REPORTED: 07/08/87

Comments:

Legend:
NQ = not quantitated
< = less than
PP = peak present

VOLATILE HYDROCARBONS (code 465)

10.9.86

LAB SAMPLE#: 160025

FIELD BLANK #: 160026

DATE SAMPLED: 06/30/87
ANALYZED: 07/06/87
REPORTED: 07/08/87

Comments:

Compound	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
HALOGENATED (code 464)		
Chloromethane	NQ	
Dichlorodifluoromethane	NQ	
Vinyl Chloride	NQ	
Bromomethane	NQ	
Chloroethane	NQ	
Dichlorofluoromethane	NQ	
Methylene Chloride	< 1.0	
Trichlorofluoromethane	< 0.50	
1,1,Dichloroethene	< 0.20	
Allyl Chloride	< 0.50	
1,1,Dichloroethane	< 0.20	
c-1,2 Dichloroethene	< 0.20	
t-1,2 Dichloroethene	< 0.20	
Chloroform	< 0.20	
112 Trichlorotrifluoroethane	< 0.50	
1,2, Dichloroethane	< 0.20	
Dibromomethane	< 1.0	
1,1,1, Trichloroethane	< 0.20	
Carbon Tetrachloride	< 0.20	
Bromodichloromethane	< 0.50	
Dichloroacetonitrile	NQ	
2,3 Dichloro-1-propene	< 0.20	
1,2 Dichloropropane	< 0.20	
1,1 Dichloro-1-propene	< 0.20	
t-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethene	< 0.20	
1,3 Dichloropropane	NQ	
Chlorodibromomethane	< 0.50	
c-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethane	< 0.20	
1,2 Dibromoethane	< 0.50	
2-Chloroethylvinyl ether	NQ	
Bromoform	< 1.0	
1,1,1,2 Tetrachloroethane	< 0.20	
1,2,3 Trichloropropane	NQ	
1,1,2,2 Tetrachloroethene	< 2.0	
1,1,2,2 Tetrachloroethane	< 2.0	
Pentachloroethane	NQ	
Chlorobenzene	< 0.50	
1,3 Dichlorobenzene	< 1.0	
1,2 Dichlorobenzene	< 1.0	
1,4 Dichlorobenzene	< 1.0	
NON-HALOGENATED (code 462)		
Acetone	< 30.0	
Tetrahydrofuran	< 10.0	
Ethyl Ether	< 1.0	
Methyl Ethyl Ketone	< 10.0	
Benzene	< 0.50	0.7
Methyl Isobutyl Ketone	< 2.0	
Toluene	< 0.50	
Ethyl Benzene	< 0.50	
Cumene	< 1.0	
m Xylene	< 0.50	
p & o Xylene	< 0.50	

Legend:
NQ = not quantitated
< = less than
PP = peak present

VOLATILE HYDROCARBONS (code 465)

10.9.86

Compound	REPORTING LIMIT (UG/L)	AMOUNT FOUND (UG/L)
HALOGENATED (code 464)		
Chloromethane	NQ	
Dichlorodifluoromethane	NQ	
Vinyl Chloride	NQ	
Bromomethane	NQ	
Chloroethane	NQ	
Dichlorofluoromethane	NQ	
Methylene Chloride	< 1.0	
Trichlorofluoromethane	< 0.50	
1,1,Dichloroethene	< 0.20	
Allyl Chloride	< 0.50	
1,1,Dichloroethane	< 0.20	
c-1,2 Dichloroethene	< 0.20	
t-1,2 Dichloroethene	< 0.20	
Chloroform	< 0.20	
112 Trichlorotrifluoroethane	< 0.50	
1,2, Dichloroethane	< 0.20	
Dibromomethane	< 1.0	
1,1,1, Trichloroethane	< 0.20	
Carbon Tetrachloride	< 0.20	
Bromodichloromethane	< 0.50	
Dichloroacetonitrile	NQ	
2,3 Dichloro-1-propene	< 0.20	
1,2 Dichloropropane	< 0.20	
1,1 Dichloro-1-propene	< 0.20	
t-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethene	< 0.20	
1,3 Dichloropropane	NQ	
Chlorodibromomethane	< 0.50	
c-1,3 Dichloro-1-propene	< 0.20	
1,1,2 Trichloroethane	< 0.20	
1,2 Dibromoethane	< 0.50	
2-Chloroethylvinyl ether	NQ	
Bromoform	< 1.0	
1,1,1,2 Tetrachloroethane	< 0.20	
1,2,3 Trichloropropane	NQ	
1,1,2,2 Tetrachloroethene	< 2.0	
1,1,2,2 Tetrachloroethane	< 2.0	
Pentachloroethane	NQ	
Chlorobenzene	< 0.50	
1,3 Dichlorobenzene	< 1.0	
1,2 Dichlorobenzene	< 1.0	
1,4 Dichlorobenzene	< 1.0	
NON-HALOGENATED (code 462)		
Acetone	< 20.0	
Tetrahydrofuran	< 10.0	
Ethyl Ether	< 1.0	
Methyl Ethyl Ketone	< 10.0	
Benzene	< 0.50	
Methyl Isobutyl Ketone	< 2.0	
Toluene	< 0.50	
Ethyl Benzene	< 0.50	
Cumene	< 1.0	
m Xylene	< 0.50	
p & o Xylene	< 0.50	

LAB SAMPLE#: 160026

FIELD BLANK #: 160026

DATE SAMPLED: 06/30/87
ANALYZED: 07/06/87
REPORTED: 07/08/87

Comments:

Legend:
NQ = not quantitated
< = less than
PP = peak present

MINNESOTA DEPARTMENT OF HEALTH
CHEMICAL LABORATORIES

Budget No. PCA-21C

Date Collected 6/30/87

ORGANIC CHEMISTRY UNIT

Collected By J. Strudell, L. Johnson

WATER ANALYSES ONLY

Date Received 6-30-87

Report To Jim Strudell

Sample Number		Field Number	Sample Location and/or Description (Town, County, etc.)	Containers: Type and Number
160027	a	NS-1	North scrubber water pond	2 jugs
160028	b	NS-2	Wet scrubber effluent	1 jug
160029	c		Blank	
	d			
	e			

This Line for LAB SAMPLE NUMBER ONLY.		a 160027	b 160028	c 160029	d	e
Chlorophyll A	450					
Volatile Hydrocarbons	465					
Purgeable Aromatics	462					
Purgeable Halogenated	464					
Gasoline/Fuel Oil	463					
PAH	470	Results attached				
Phenolic Compounds	480					
Phthalate Esters	490					
PCB's	420					
Herbicides	425					
2,4-D						
2,4,5-TP (Silvex)						
2,4,5-T						
Pesticides	421					
Lindane						
Methoxychlor						
Toxaphene						
Endrin						
Other Pesticides						
FIELD BLANK #: 160029						

COMPLETED
AUG 1 1987
CHEMICALS

6

2382010

MINNESOTA DEPARTMENT OF HEALTH
CHEMICAL LABORATORIES

POLYNUCLEAR AROMATIC HYDROCARBONS (CONCENTRATION IN UG/L)

	QUANTITATION LIMIT (4 LITER)	160027	160028	160029
Naphthalene	< 2.0	< 2.2	2.1	< 2.2
Acenaphthylene	< 3.1	< 3.4	< 35	< 3.4
Acenaphthene *	< 1.1	< 1.2	< 1.3	< 1.2
Fluorene *	< 1.2	< 1.3	2.8	< 1.3
Phenanthrene *	< 0.71	< 0.77	12.4	< 0.79
Anthracene *	< 0.045	< 0.049	< 0.51	< 0.050
Fluoranthene *	< 0.021	0.45	1.0	< 0.023
Pyrene *	< 0.27	0.73	< 3.1	< 0.30
Benzo(a)anthracene	< 0.009	< 0.010	< 0.10	< 0.10
Chrysene	< 0.25	0.88	< 2.9	< 0.28
Benzo(b)fluoranthene	< 0.002	0.040	0.15	< 0.002
Benzo(k)fluoranthene*	< 0.001	0.012	0.034	< 0.001
Benzo(a)pyrene	< 0.002	0.005	< 0.023	< 0.002
Dibenzo(a,h)anthracene	< 0.008	< 0.009	< 0.091	< 0.009
Benzo(ghi)perylene	< 0.004	0.011	< 0.046	< 0.004
Indeno(1,2,3-cd)pyrene	< 0.091	< 0.099	< 1.0	< 0.10

Date Collected:	6-30-87	6-30-87	6-30-87
Date Received:	6-30-87	6-30-87	6-30-87
Date Extracted:	7-09-87	7-09-87	7-09-87
Date Extract Cleanup:	8-13-87	8-13-87	8-13-87
Date Analyzed:	8-15-87	8-15-87	8-15-87
Date Reported:	8-19-87	8-19-87	8-19-87

FIELD BLANK: 160029

	QUALITY CONTROL SPIKE MATRIX: 160027 (X10 dilution)			QUALITY CONTROL DUPLICATE MATRIX:
	FOUND UG	TRUE UG	% REC	
Naphthalene	<22			
Acenaphthylene	51	94	54%	
Acenaphthene	<12			
Fluorene	<13			
Phenanthrene	24	38	63%	
Anthracene	<0.49			
Fluoranthene	73	94	78%	
Pyrene	<2.7			
Benzo(a)anthracene	35	56	63%	
Chrysene	<2.5			
Benzo(b)fluoranthene	12	15	80%	
Benzo(k)fluoranthene	0.025			
Benzo(a)pyrene	59	112	53%	
Dibenzo(a,h)anthracene	25	41	61%	
Benzo(ghi)perylene	77	113	68%	
Indeno(1,2,3-cd)pyrene	<0.91			

Analysis was performed by high pressure liquid chromatography equipped with variable wavelength ultraviolet (UV) and fluorescence detectors.
All positive values were identified on at least two wavelength settings.
Quantitation limits are based on 4 liter volume, less than values of samples are adjusted for sample volume (and sample dilution where applicable).
Sample 160028 required X10 dilution for all compounds except naphthalene,

Minnesota Pollution Control Agency

Program Development
Date: AUG 14 1987

GENERAL LAB SHEET

BILLING #: PCA-21C

Collected by J. Strudell/L. Johnson
Phone 612/296-7238
Report to Jim Strudell
Date Received by Lab 6-30-87

River, town, etc.	Sampling Point and/or Source of Sample
a New Scandia	Scrubber Water Pond
b	
c	
d	
e	

Lab #	Field #	Date Collected yr-mo-day	Time Collected 24-hr time	00010 Field Temp °C	00136 Lab Temp °C	00300 D.O. mg/l	00400 Field pH, Std Units	00403 Lab pH, Std Units 013	31613 Fec. Coli #/100ml 310	31633 E. Coli #/100 ml 311
160022	NS-1	87-6-30	10:00	29						
160023	NS-2	87-6-30	11:00	55						

Lab #	Field #	00500 T Solids mg/l 001	00505 Total Vol Solids mg/l 002	70300 T.Dissolved Solids @180 C° mg/l 005	00530 Total SusSolids mg/l 003	00076 Turbidity NTU 011	00940 Chloride as Cl, mg/l 023	00310 BOD_5 mg/l 096	80082 $CBOD_5$ N-Inhibit mg/l 083	80087 $CBOD_{20}$ N-Inhibit mg/l 082
					46.					
					11000.					

Lab #	Field #	31639 Entcocci #/100 ml 312	31673 Fec Strep #/100 ml 313	70507 ortho Phos as P, mg/l 063	00665 Total Phos as P, mg/l 059	00625 Kjl-N as N, mg/l 068	00605 Org-N as N, mg/l 065	00610 NH_3-N as N, mg/l 064	00630 NO_2-N + NO_3-N as N, mg/l 069	00615 NO_2-N as N, mg/l 067	32211 Chlor a, µg/l 450

COMPLETED
AUG 13 1987
CHEMICAL LABS

Revised April 1, 1985

Minnesota Pollution Control Agency

SUPPLEMENTARY GENERAL LAB SHEET

COLLECTED BY Strudell, Larry Johnson
REPORT TO Jim Strudell

BILLING # PCA-
DATE RECEIVED BY LAB 6-30-87

	Lab #	Field #	Date Collected, yr.-mo.-day	Time Collected, 24-hr. time	00910 Calcium as $CaCO_3$, mg/l 251	00920 Magnesium as $CaCO_3$, mg/l 253	00900 T. Hardness as $CaCO_3$, mg/l 021	00425* Bicar. Alk. as $CaCO_3$, mg/l 019	00410 Total Alk. as $CaCO_3$, mg/l 022	00335 COD mg/l 097	00680 TOC mg/l 098
a	160022	NS-1	87-6-30	10:00							
b	160023	NS-2	87-6-30	11:00							
c											
d											
e											

	01002 T. Arsenic, ug/l 108	01027 T. Cadmium, ug/l 125/122**	01034 T. Chromium ug/l 129	01032 Chrom. +6 ug/l 034	01042 T. Copper, ug/l 145/143**	01045 T. Iron, ug/l 152/150**	01051 T. Lead, ug/l 159/157**	01055 Manganese, ug/l 166/164**	71900 T. Mercury, ug/l 200	01067 T. Nickel, ug/l 173/171**	01092 T. Zinc, ug/l 194/192**
a	1.7	0.24	1.8				5.7				
b	69.	6.5	320.				1000.				
c											
d											
e											

	01105 T. Aluminum, ug/l 101	01007 T. Barium, ug/l 115	01022 T. Boron, mg/l 031	00080 Color, Pt-Co 012	00095 Conduct. @ 25°C, umho/cm 014	00951 Fluoride as F^-, mg/l 029	38260 Methyl. Blue Active Sub. (MBAS), mg/l 035	00937 T. Potas. as K^- mg/l 255	01147 T. Selenium ug/l 178	01077 T. Silver, ug/l 185	00929 T. Sodium, mg/l 257
a											
b											
c											
d											
e											

	00746 Sulfide as $S^=$, mg/l 088	00945 Sulfate as $SO_4^=$, mg/l 028	00556 Oil and Grease, mg/l 089	32730 T Phenol ug/l 085	00720 T Cyanide as CN^-, mg/l 086
a				12.	
b				42.	
c					
d					
e					

* Requires pH, Total Alkalinity, and TDS

** Flame AA/FAAS (circle your choice, or no analysis will be done)

PQ-00043-02