Site Suitability Review of the Alsen Municipal Landfill

by
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Prepared by the
North Dakota Geological Survey
and the
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ND Landfill Site Investigation No. 25

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Bismarck, North Dakota
1994

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INTRODUCTION

Purpose

The North Dakota State Engineer and the North Dakota State Geologist were instructed by the 52nd State Legislative Assembly to conduct site-suitability reviews of the solid waste landfills in the state of North Dakota. These reviews are to be completed by July 1, 1995 (North Dakota Century Code 23-29-07.7). The purpose of this program is to evaluate site suitability of each landfill for disposal of solid waste based on geologic and hydrologic characteristics. Reports will be provided to the North Dakota State Department of Health and Consolidated Laboratories (NDSDHCL) for use in site improvement, site remediation, or landfill closure. A one time ground-water sampling event was performed at each site, and additional studies may be necessary to meet the requirements of the NDSDHCL for continued operation of solid waste landfills. The Alsen solid waste landfill is one of the landfills being evaluated.

Location of the Alsen Landfill

The Alsen municipal solid waste landfill is located one half mile east of the City of Alsen in Township 160 North, Range 62 West, SE 1/4, SE 1/4, Section 31. The landfill site encompasses approximately 3 acres.

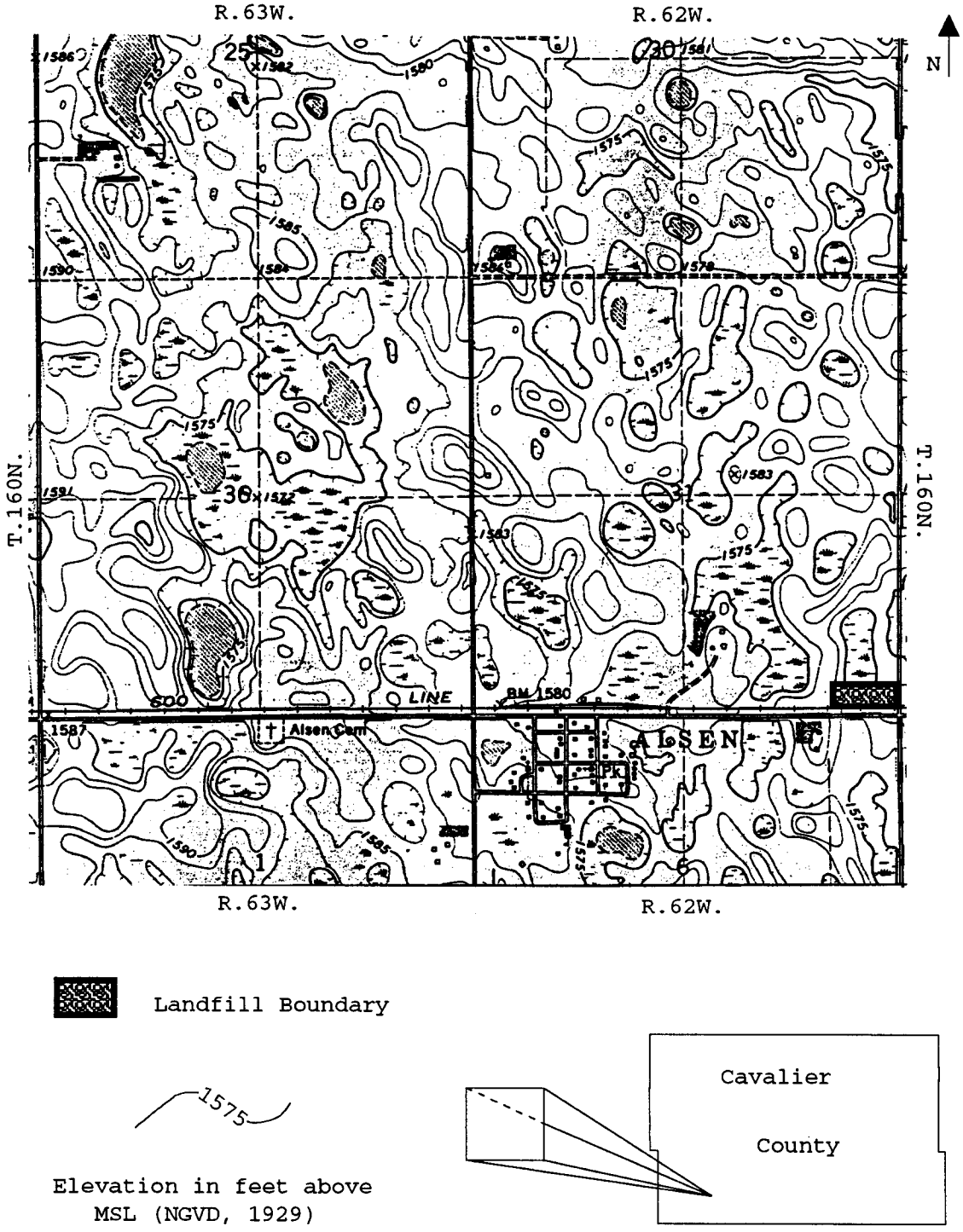

Figure 1. Location of the Alsen landfill in the SE 1/4 of the SE 1/4 of section 31, T160N, R62W.

Previous Site Investigations

Three test borings were drilled at the Alsen landfill in 1992 by Twin City Testing. The lithologic descriptions for these borings were not available for this report.

Methods of Investigation

The Alsen study was accomplished by means of: 1) drilling test holes; 2) constructing and developing monitoring wells; 3) collecting and analyzing water samples; and 4) measuring water levels. Well abandonment procedures were followed for non-permanent monitoring wells.

Test-Drilling Procedure

The drilling method was based on the site's geology and depth to ground water, as determined by the preliminary evaluation. A hollow-stem auger was used at the Alsen landfill because the sediments were poorly consolidated and the depth to groundwater was expected to be less than 70 feet. The lithologic descriptions were determined from the drilling returns.

Monitoring Well Construction and Development

Four test holes were drilled at the Alsen landfill with monitoring wells installed in each of the test holes. The number of wells installed was based on the geologic and topographic characteristics of the site. The wells were located near the active area of the landfill. The depth and intake interval of each well was selected to monitor the water level at the top of the uppermost aquifer.

Wells were constructed following a standard design (Fig. 2) intended to comply with the construction regulations of the NDSDHCL and the North Dakota Board of Water Well Contractors (North Dakota Department of Health, 1986). The wells were constructed using a 2-inch diameter, SDR21, polyvinyl chloride (PVC) well casing and a PVC screen, either 5 or 10 feet long, with a slot-opening size of 0.012 or 0.013 inches. The screen was fastened to the casing with stainless steel screws (no solvent weld cement was used). After the casing and screen were installed into the drill hole, the annulus around the screen was filled with No. 10 (grain-size diameter) silica sand to a height of two feet above the top of the screen. High-solids bentonite grout and/or neat cement was placed above the silica sand to seal the annulus to approximately five feet below land surface. The remaining annulus was filled with drill cuttings. The permanent wells were secured with a protective steel casing and a locking cover protected by a two-foot-square concrete pad.

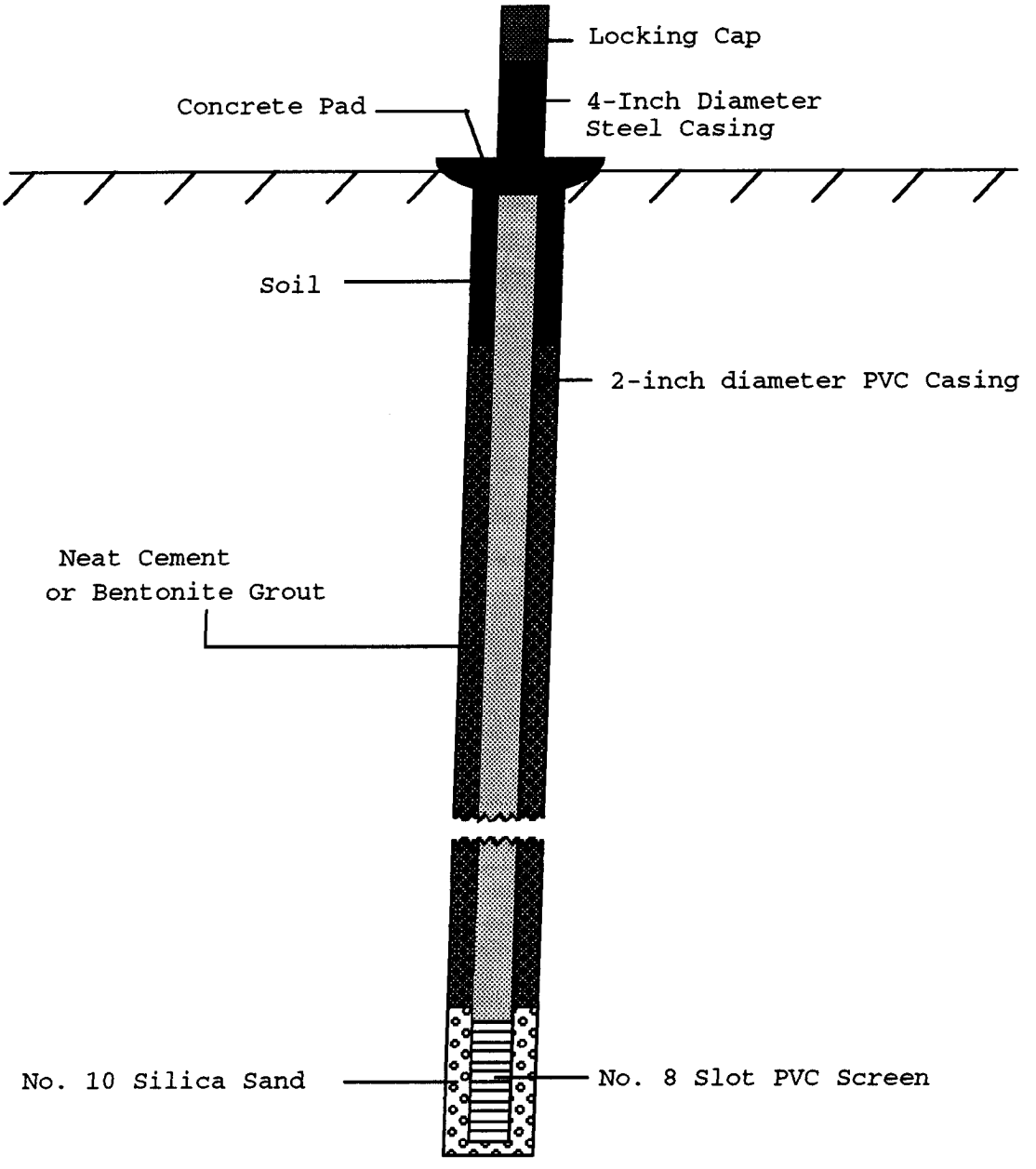

Figure 2. Construction design used for monitoring wells installed at the Alsen landfill.

All monitoring wells were developed using a stainless steel bladder pump or a teflon bailer. Any drilling fluid and fine materials present near the well were removed to insure movement of formation water through the screen.

The Mean Sea Level (MSL) elevation was established for each well by differential leveling to Third Order accuracy. The surveys established the MSL elevation at the top of the casing and the elevation of the land surface next to each well.

Collecting and Analyzing Water Samples

Water-quality analyses were used to determine if leachate is migrating from the landfill into the underlying ground-water system. Selected field parameters, major ions, and trace elements were measured for each water sample. These field parameters and analytes are listed in Appendix A with their Maximum Contaminant Levels (MCL). MCLs are enforcable drinking water standards that represent the maximum permissible level of a contaminant as stipulated by the U.S. Environmental Protection Agency (EPA).

Water samples were collected using a bladder pump constructed of stainless steel with a teflon bladder. A teflon bailer was used in monitoring wells with limited transmitting capacity. Before sample collection, three to four well volumes were extracted to insure that unadulterated formation water was sampled. Four samples from each well

were collected in high density polyethylene plastic bottles as follows:

1) Raw (500 ml)

2) Filtered (500 ml)

3) Filtered and acidified (500 ml)

4) Filtered and double acidified (500 ml).

The following parameters were determined for each sample. Specific conductance, field pH, bicarbonate, and carbonate were analyzed using the raw sample. Sulfate, chloride, nitrate*, and dissolved solids were analyzed using the filtered sample. Calcium, magnesium, sodium, potassium, iron, and manganese were analyzed from the filtered, acidified sample. Cadmium, lead, arsenic, and mercury were analyzed using the filtered double-acidified samples.

One well was sampled for Volatile Organic Compounds (VOC) analysis. This sample was collected at a different time than the standard water-quality sample. The procedure used for collecting the VOC sample is described in Appendix B. Each sample was collected with a plastic throw-away bailer and kept chilled. These samples were analyzed within the permitted 14-day holding period. The standard water-quality analyses were performed at the North Dakota State Water Commission (NDSWC) Laboratory and VOC analyses were performed by the NDSDHCL.

* No special preservative techniques were applied to nitrate samples and as a result reported nitrate concentrations may be lower than actual.

Water-Level Measurements

Water-level measurements were taken at least three times at a minimum of two-week intervals. The measurements were taken using a chalked-steel tape or an electronic (Solnist 10078) water-level indicator. These measurements were used to determine the shape and configuration of the water table.

Well-Abandonment Procedure

The test holes and monitoring wells that were not permanent were abandoned according to NDSDHCL and Board of Water Well Contractors regulations (North Dakota Department of Health, 1986). The soil around the well was dug to a depth of approximately three to four feet below land surface (Fig. 3) to prevent disturbance of the sealed wells. The screened interval of the well was plugged with bentonite chips to a height of approximately one foot above the top of the screen and the remaining well casing was filled with neat cement. The upper three to four feet was then filled with cuttings and the disturbed area was blended into the surrounding land surface. Test holes were plugged with high-solids bentonite grout and/or neat cement to a depth approximately five feet below land surface. The upper five feet of the test hole was filled with soil cuttings.

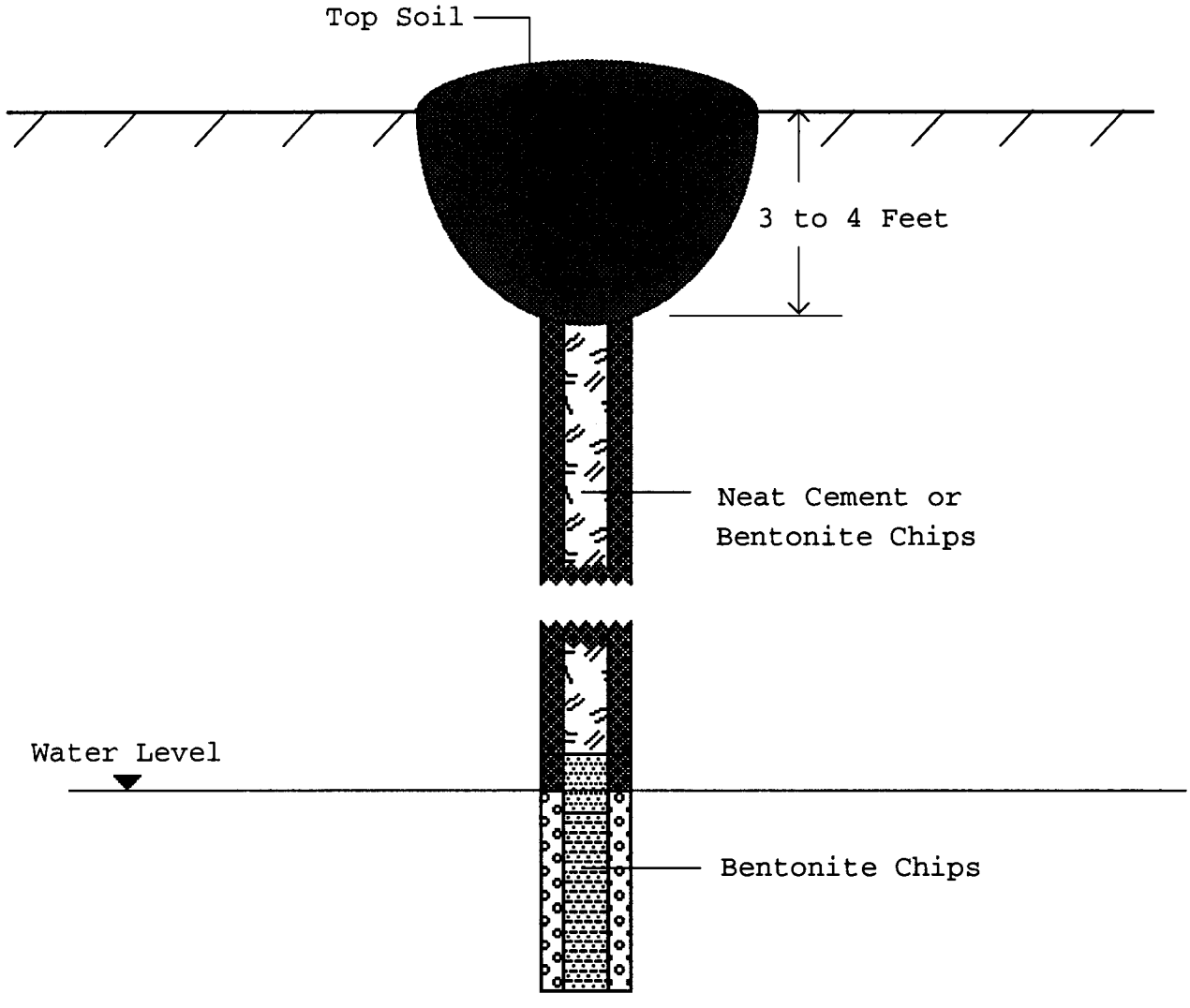

Figure 3. Monitoring well abandonment procedures.

Location-Numbering System

The system for denoting the location of a test hole or observation well is based on the federal system of rectangular surveys of public land. The first and second numbers indicate Township north and Range west of the 5th Principle Meridian and baseline (Fig. 3). The third number indicates the section. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section (160-acre tract), quarter-quarter section (40-acre tract), and quarter-quarter-quarter section (10-acre tract). Therefore, a well denoted by 160-062-31DDD would be located in the SE1/4, SE1/4, SE1/4, Section 31, Township 160 North, Range 62 West. Consecutive numbers are added following the three letters if more than one well is located in a 10-acre tract, e.g. 160-062-31DDD1 and 160-062-31DDD2.

GEOLOGY

The Alsen landfill is located in an area of collapsed glacial sediments with moderate relief and hummocky topography. Drainage is non-integrated, with abundant sloughs and closed depressions.

Glacial sediments at the landfill are composed mainly of sandy clay till and clayey sand till (Fig. 5, lithologic logs

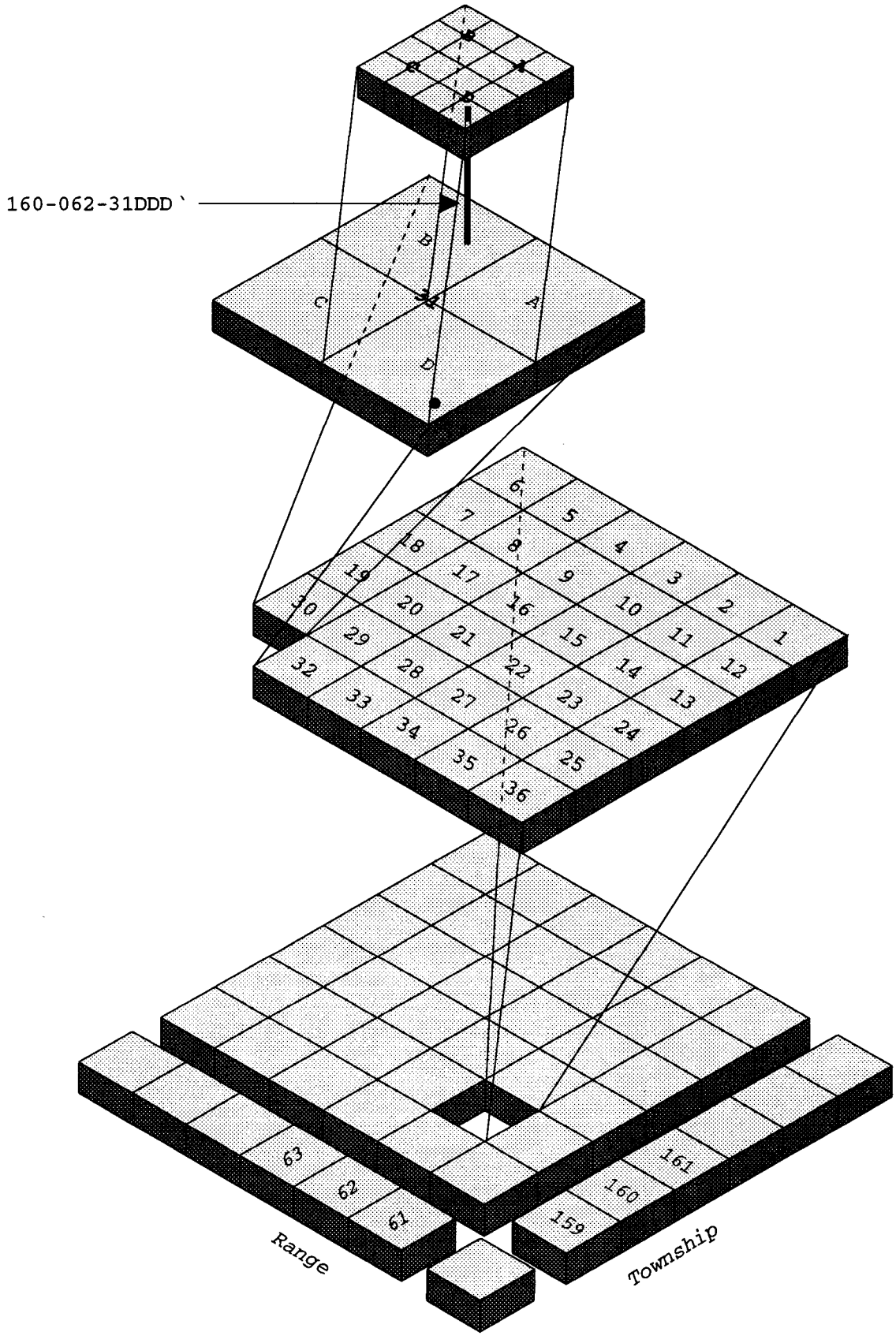

Figure 4. Location-numbering system for the Alsen landfill.

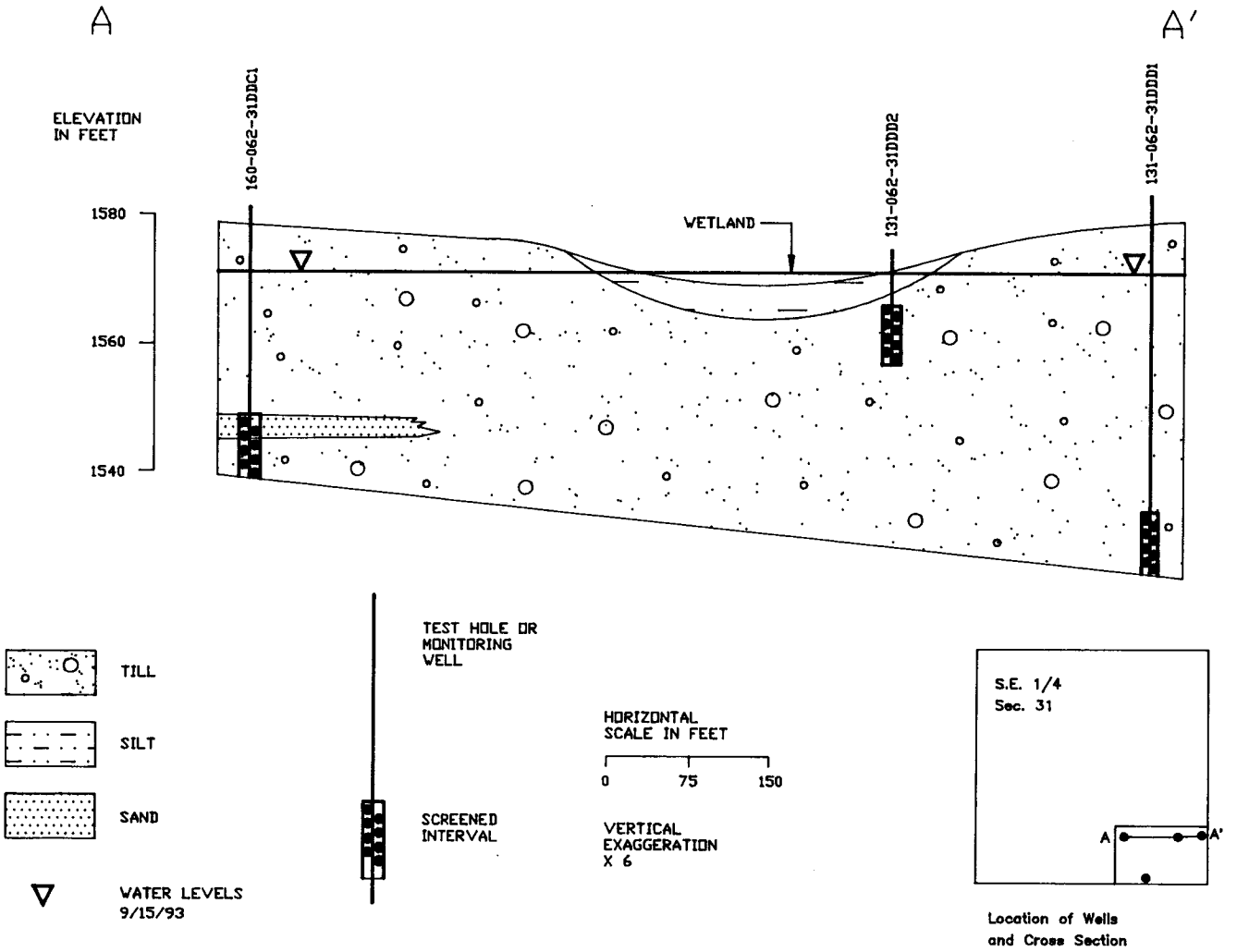

Figure 5. Geohydrologic section A-A' in the Alsen Landfill.

in Appendix C). Test hole 160-062-31DDC1 penetrated a thin layer of fine-grained sand at a depth of 30 feet, and test hole 160-062-31DDC2 penetrated a layer of sandy silt at a depth of 14 feet. A thin layer of silt also occurs at the surface near the slough (test holes 160-062-31DDC2 and 31DDD2).

The glacial sediments are underlain by the Pierre Formation. A State Water Commission test hole drilled three-fourths mile west of the landfill penetrated the Pierre Formation at a depth of 150 feet (Hutchinson, 1973). The Cretaceous Pierre Formation is composed of hard, siliceous gray shale, soft, black shale, clay and bentonite (Arndt, 1975).

HYDROLOGY

Surface-Water Hydrology

The Alsen landfill is located in an area of gently rolling topography. The rolling topography appears to have created numerous closed-basin wetlands. The Alsen landfill is located at the southern end of one of these wetlands (Fig. 6). There are numerous wetlands within a one-mile radius of the landfill. It is not known if the wetlands are hydraulically connected. The surrounding wetlands should not be affected by contaminated runoff from the landfill.

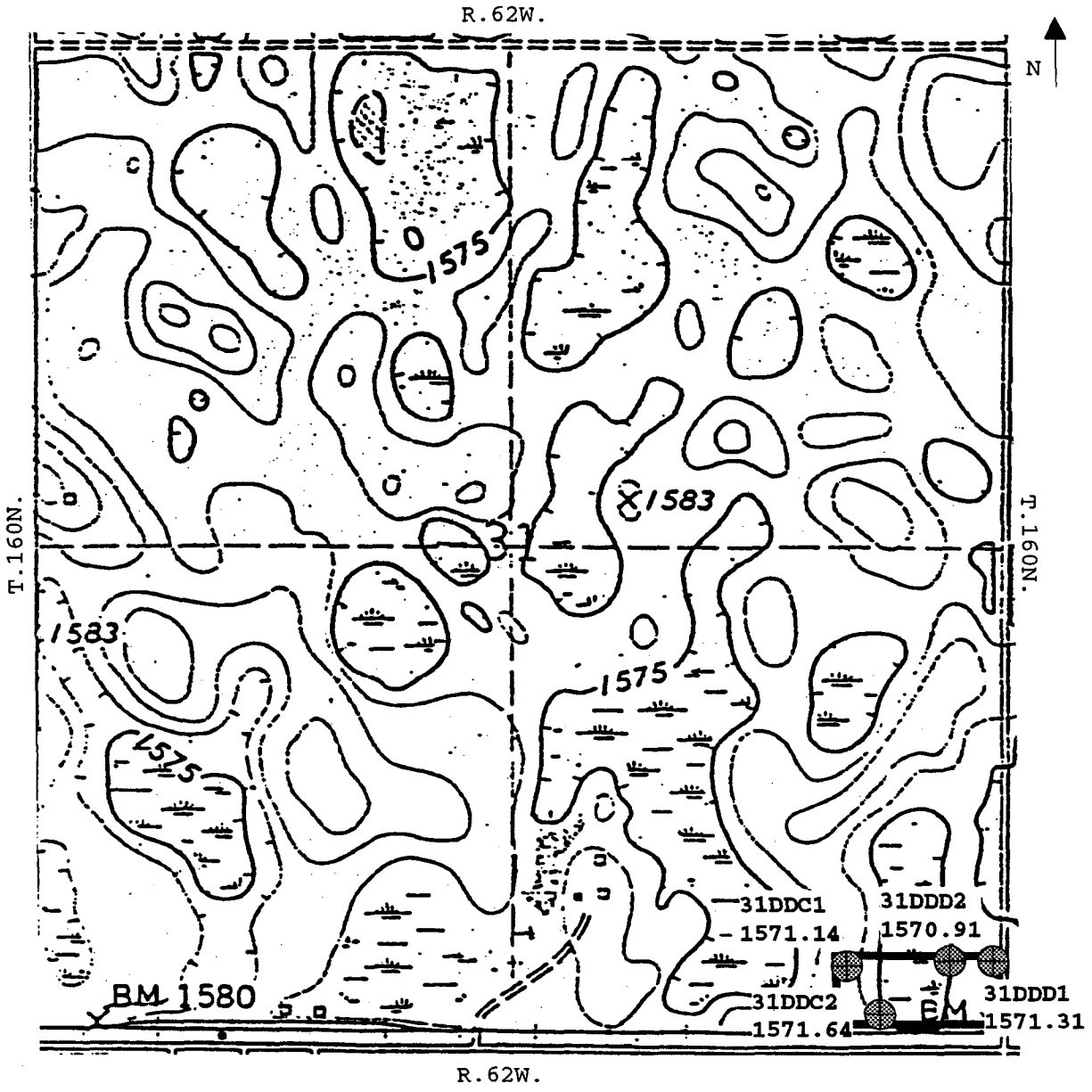

Figure 6. Location of monitoring wells at the Alsen landfill.

Surface water was present within the disposal area and may recieve contaminated runoff from the landfill.

Regional Ground-Water Hydrology

Regional aquifers consist of both glacial and bedrock lithologies. The Dakota aquifer consists of sand and occurs at a depth of 600 to 700 feet. This aquifer is characterized by a sodium-chloride type water (Hutchinson, 1977) and should not be affected by contaminant migration from the landfill.

The Pierre Formation underlies the glacial drift and is a source of ground water in areas of extensive fracturing. The Pierre aquifer is characterized by a sodium-sulfate type water in the upper regions of the aquifer and by a sodium-chloride type water in the lower regions (Hutchinson, 1977). The Pierre aquifer should not be susceptible to contaminant migration from the landfill because it is underlain by a relatively thick layer of low hydraulic conductivity glacial till.

The Munich aquifer is the only major glacial aquifer in the area of the Alsen landfill. The Munich aquifer is located about 10 miles northwest of the landfill and is characterized by a sodium-sulfate type water. This aquifer should not be affected by the landfill because it is located about 10 miles up-gradient from the landfill.

Undifferentiated sand and gravel aquifers are found throughout the region. These aquifers are not extensive and small quantities of water are usually found with slow

recharge potential. The water chemistry of these aquifers is variable.

Local Ground-Water Hydrology

Four monitoring wells were installed within the boundaries of the Alsen landfill (Fig. 6). In the landfill area the water-table ranges from one to eight feet below the surface. Wells 31DDD2 and 31DDC2 are located next to a wetland. The well screens were placed near the top of the uppermost aquifer. Five water-level measurements were taken over an eight-week period (Appendix D). All wells were screened within an undifferentiated sand aquifer except well 31DDC2 which was screened within a silt and clay layer. The direction of ground-water flow was not determined from this study. The wetland near well 31DDD2 probably acts as a ground-water discharge area during dry periods and a ground-water recharge area during wet periods.

Water Quality

Chemical analyses of water samples are shown in Appendix E. An anomalously high pH value of 9.13 was measured at well 31DDD1 on August 8, 1993. A pH of 11.05 was measured on August 31, 1993. The cause of this increase of pH was not determined. This well also indicated a chloride concentration of 210 mg/L, which is close to the MCL of 250

mg/L. Trace element analysis from this well also indicated elevated concentrations of arsenic (21 µg/L) and molybdenum (50 µg/L). These concentrations are below their MCL's but higher than concentrations found in the other wells. The source of these constituents may originate from the buried refuse.

Well 31DDC2 indicated a nitrate concentration of 77 mg/L which is above the MCL of 50 mg/L. This well is located next to the wetland and adjacent to a pile of rotting grain which may be the source of the nitrate (Fig. 7).

The results of the VOC analysis, from well 160-062-31DDD2, are shown in Appendix F. No VOC compounds were detected from this analysis.

CONCLUSIONS

The Alsen landfill is located in an area of collapsed glacial sediments with moderate relief and hummocky topography. Numerous closed depressions in the area surrounding the landfill form wetlands during periods of high precipitation. One wetland on the north side of the landfill extends onto the landfill property.

The landfill is underlain by about 150 feet of glacial sediments. The glacial sediments consist of sandy clay till and clayey sand till, with scattered lenses of sand and silt. The glacial sediments overlie on the Pierre Formation. The

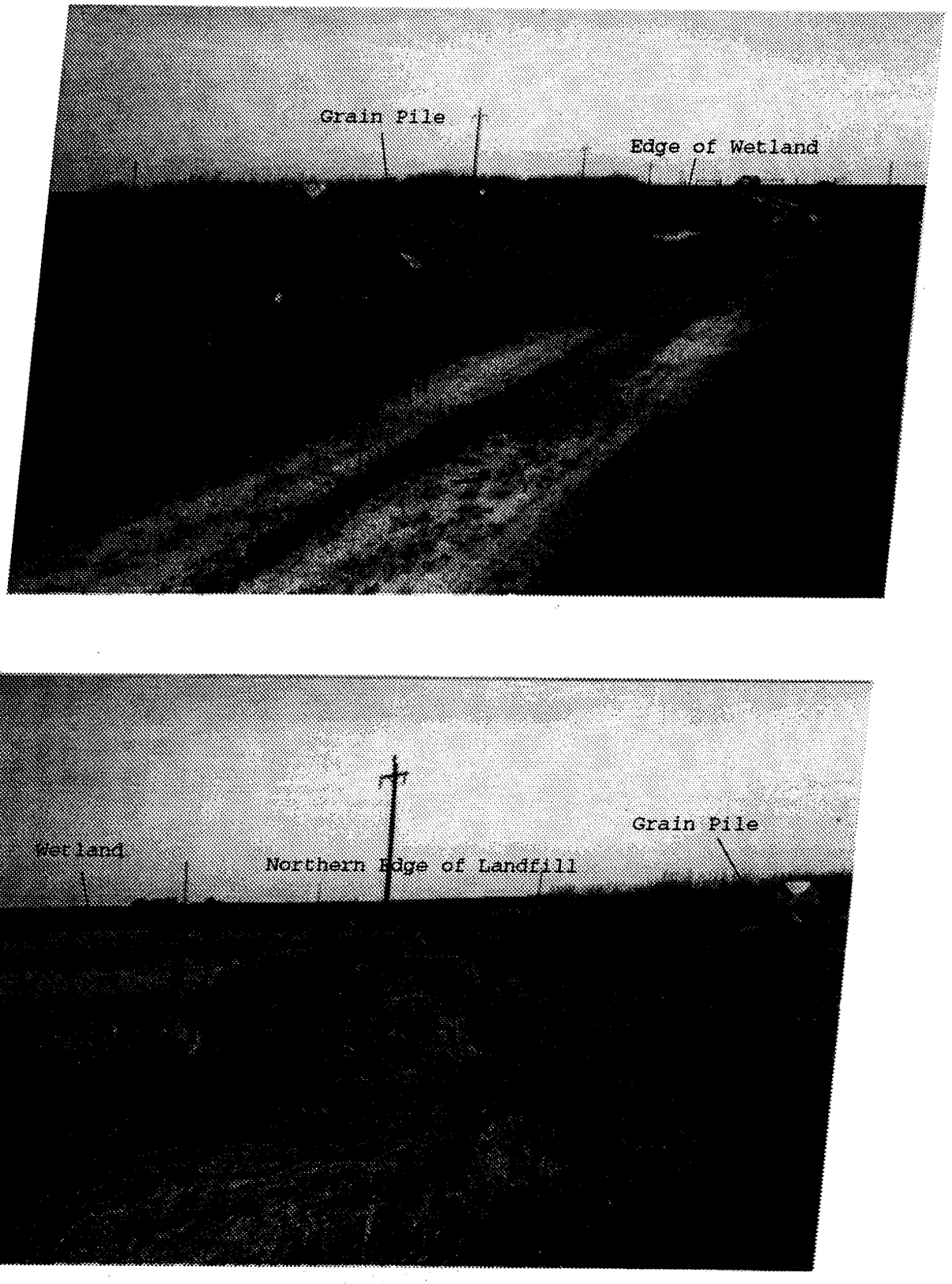

Figure 7. Photos showing location of wetland and the northern edge of the landfill and the rotting grain pile.

major aquifers in the area are the Pierre and Dakota aquifers.

In the landfill area the water table ranges from one to eight feet below the surface. The small wetland in the landfill area probably is a major local control on the direction of ground-water flow. During wet periods, the wetland functions as a ground-water recharge area and during dry periods the wetland functions as a ground-water discharge area.

Water samples from monitoring well 160-062-31DDD1 contained relatively high concentrations of chloride, arsenic, and molybdenum that may originate from the buried refuse. This well also had a high pH. A high nitrate concentration in well 160-062-31DDC2 may be caused by a nearby pile of rotting grain. No volatile organic compounds were detected in the VOC analysis from well 160-062-31DDD2.

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Arndt, B.M., 1975, Geology of Cavalier and Pembina Counties: North Dakota Geological Survey, Bulletin 62, North Dakota State Water Commission, County Groundwater Studies 20, Part I, 68 p.

Hem, J.D., 1989, Study and interpretation of the chemical characteristics of natural water: United States Geological Survey Water-Supply Paper 2254, 263 p.

Hutchinson, R.D., 1973, Ground-water basic data of Cavalier and Pembina Counties: North Dakota Geological Survey, Bulletin 62, North Dakota State Water Commission, County Groundwater Studies 20, Part II, 606 p.

Hutchinson, R.D., 1977, Ground-water resources of Cavalier and Pembina Counties: North Dakota Geological Survey, Bulletin 62, North Dakota State Water Commission, County Groundwater Studies 20, Part III, 68 p.

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APPENDIX A

WATER QUALITY STANDARDS
AND
CONTAMINANT LEVELS

Water Quality Standards and Contaminant Levels

Field Parameters	
appearance	color/odor
pH	6-9 (optimum)
specific conductance	-----
temperature	-----

Constituent	MCL (µg/L)
Arsenic	50
Cadmium	10
Lead	50
Molybdenum	100
Mercury	2
Selenium	10
Strontium	*

*EPA has not set an MCL for strontium. The median concentration for most U.S. water supplies is 100 µg/L (Hem, 1989).

	SMCL (mg/L)
Chloride	250
Iron	>0.3
Nitrate	50
Sodium	20-170
Sulfate	300-1000
Total Dissolved Solids	>1000

	Recommended Concentration Limits (mg/L)
Bicarbonate	150-200
Calcium	25-50
Carbonate	150-200
Magnesium	25-50
Hardness	>121 (hard to very hard)

APPENDIX B

SAMPLING PROCEDURE FOR VOLATILE ORGANIC COMPOUNDS

SAMPLING PROCEDURE FOR 40ML AMBER BOTTLES

Sample Collection for Volatile Organic Compounds

by
North Dakota Department of Health
and Consolidated Laboratories

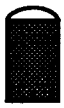
1. Three samples must be collected in the 40ml bottles that are provided by the lab. One is the sample and the others are duplicates.

2. A blank will be sent along. Do Not open this blank and turn it in with the other three samples.

3. Adjust the flow so that no air bubbles pass through the sample as the bottle is being filled. No air should be trapped in the sample when the bottle is sealed. Make sure that you do not wash the ascorbic acid out of the bottle when taking the sample.

4. The meniscus of the water is the curved upper surface of the liquid. The meniscus should be convex (as shown) so that when the cover to the bottle is put on, no air bubbles will be allowed in the sample.

convex meniscus



5. Add the small vial of concentrated HCL to the bottle.

6. Screw the cover on with the white Teflon side down. Shake vigorously, turn the bottle upside down, and tap gently to check if air bubbles are in the sample.

7. If air bubbles are present, take the cover off the bottle and add more water. Continue this process until there are no air bubbles in the sample.

8. The sample must be iced after collection and delivered to the laboratory as soon as possible.

9. The 40 ml bottles contain ascorbic acid as a preservative and care must be taken not to wash it out of the bottles. The concentrated acid must be added after collection as an additional preservative.

APPENDIX C

LITHOLOGIC LOGS OF WELLS AND TEST HOLES

160-062-31DDC1

NDSWC

Date Completed:	6/21/93	Well Type:	PVC
Depth Drilled (ft):	40	Source of Data:	
Screened Interval (ft):	30-40	Principal Aquifer :	UND
Casing size (in) & Type:	2	L.S. Elevation (ft)	1577.67

Lithologic Log

Unit	Description	Depth (ft)
SOIL		0-2
CLAY	SILTY, TRACE SAND AND GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	2-14
CLAY	SANDY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	14-23
CLAY	SANDY, TRACE GRAVEL, OLIVE GRAY 5Y4/1 (TILL)	23-30
SAND	FINE GRAINED, TRACE SMALL PEBBLES, OLIVE GRAY 5Y4/1, WET	30-32
CLAY	SANDY, TRACE GRAVEL, OLIVE GRAY 5Y4/1 (TILL)	32-40

160-062-31DDC2

NDSWC

Date Completed:	6/21/93	Well Type:	PVC
Depth Drilled (ft):	20	Source of Data:	
Screened Interval (ft):	10-20	Principal Aquifer :	UND
Casing size (in) & Type:	222	L.S. Elevation (ft)	1572.83

Lithologic Log

Unit	Description	Depth (ft)
SOIL		0-2
SILT	SANDY, MEDIUM LIGHT GRAY N6	2-6
CLAY	SANDY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	6-14
SILT	SANDY, MODERATE YELLOWISH BROWN 10YR5/4	14-18
CLAY	TRACE SAND AND GRAVEL, OLIVE GRAY 5Y4/1 (TILL)	18-20

160-062-31DDD1

NDSWC

Date Completed:	6/7/93	Well Type:	PVC
Depth Drilled (ft):	55	Source of Data:	
Screened Interval (ft):	45-55	Principal Aquifer :	UND
Casing size (in) & Type:	2	L.S. Elevation (ft)	1578.92

Lithologic Log

Unit	Description	Depth (ft)
SOIL		0-2
CLAY	TRACE SAND, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	2-6
CLAY	SANDY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	6-23
SAND	CLAYEY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4 (TILL)	28-33
SAND	CLAYEY, TRACE GRAVEL, OLIVE GRAY 5Y4/1 (TILL)	33-38
SAND	CLAYEY, TRACE GRAVEL, DARK GREENISH GRAY 5GY4/1 (TILL)	38-55

160-062-31DDD2

NDSWC

Date Completed:	6/7/93	Well Type:	PVC
Depth Drilled (ft):	15	Source of Data:	
Screened Interval (ft):	5-15	Principal Aquifer :	UND
Casing size (in) & Type:	2	L.S. Elevation (ft)	1571.87

Lithologic Log

Unit	Description	Depth (ft)
SOIL		0-2
SILT	CLAYEY, MODERATE YELLOWISH BROWN 10YR5/4	2-4
SAND	CLAYEY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4, WET (TILL)	4-10
SAND	CLAYEY, TRACE GRAVEL, MODERATE YELLOWISH BROWN 10YR5/4, DRY (TILL)	10-15

APPENDIX D

WATER-LEVEL TABLES

Alsen Water Levels
8/05/93 to 10/04/93

160-062-31DDC1 — LS Elev (msl,ft)=1577.67
UND Aquifer — SI (ft.)=30-40

Date	Depth to Water (ft)	WL Elev (msl, ft)	Date	Depth to Water (ft)	WL Elev (msl, ft)
08/05/93	7.87	1569.80	09/15/93	6.53	1571.14
08/18/93	7.41	1570.26	10/04/93	6.17	1571.50
08/31/93	6.94	1570.73			

160-062-31DDC2 — LS Elev (msl,ft)=1572.83
UND Aquifer — SI (ft.)=10-20

Date	Depth to Water (ft)	WL Elev (msl, ft)	Date	Depth to Water (ft)	WL Elev (msl, ft)
08/05/93	0.70	1572.13	09/15/93	1.19	1571.64
08/18/93	0.63	1572.20	10/04/93	2.07	1570.76
08/31/93	0.84	1571.99			

160-062-31DDD1 — LS Elev (msl,ft)=1578.92
UND Aquifer — SI (ft.)=45-55

Date	Depth to Water (ft)	WL Elev (msl, ft)	Date	Depth to Water (ft)	WL Elev (msl, ft)
08/05/93	9.12	1569.80	09/15/93	7.61	1571.31
08/18/93	8.50	1570.42	10/04/93	7.29	1571.63
08/31/93	8.03	1570.89			

160-062-31DDD2 — LS Elev (msl,ft)=1571.87
UND Aquifer — SI (ft.)=5-15

Date	Depth to Water (ft)	WL Elev (msl, ft)	Date	Depth to Water (ft)	WL Elev (msl, ft)
08/05/93	0.80	1571.07	09/15/93	0.96	1570.91
08/18/93	0.80	1571.07	10/04/93	1.02	1570.85
08/31/93	0.84	1571.03			

APPENDIX E

MAJOR ION AND TRACE-ELEMENT CONCENTRATIONS

Alsen Water Quality
Major Ions

Location	Screened Interval (ft)	Date Sampled	SiO_2	Fe	Mn	Ca	Mg	Na	K	HCO_3	CO_3	SO_4	Cl	F	NO_3	B	TDS	Hardness $CaCO_3$	as NCH	% Na	SAR	Spec Cond (µmho)	Temp (∞C)	pH
			(milligrams per liter)																					
160-062-31DDC1	30-40	08/05/93	20	0.04	2.9	340	200	770	20	499	0	2900	80	0.4	14	0.58	4590	1700	1300	50	8.1	5020	12	7.42
160-062-31DDC2	10-20	08/05/93	25	0.08	0.22	650	520	390	26	419	0	4100	150	0.3	77	0.14	6140	3800	3400	18	2.7	5710	10	7.34
160-062-31DDD1	45-55	08/05/93	29	0.03	0.12	260	58	640	24	116	0	1900	210	0.2	0.1	0.55	3180	890	790	60	9.3	3850	8	9.13
160-062-31DDD2	5-15	08/05/93	27	0.06	0.27	430	280	170	27	686	0	2000	89	0.5	10	0.24	3370	2200	1700	14	1.6	3570	12	7.58

Trace Element Analyses

Location	Date Sampled	Selenium	Lead	Cadmium	Mercury	Arsenic	Molybdenum	Strontium
		(micrograms per liter)						
160-062-31DDC1	8/05/93	0	0	0	0	7	13	2200
160-062-31DDC2	8/05/93	0	0	0	0	2	9	2000
160-062-31DDD1	8/05/93	0	0	0	0	21	50	2000
160-062-31DDD2	8/05/93	1	0	0	0	3	10	1300

APPENDIX F

VOLATILE ORGANIC COMPOUNDS
FOR WELL 144-088-01DDB

Volatile Organic Compounds
and
Minimum Concentrations

Concentrations are based only on detection limits. Anything over the detection limit indicates possible contamination.

Constituent	Chemical Analysis µg/L
Benzene	<2
Vinyl Chloride	<1
Carbon Tetrachloride	<2
1,2-Dichlorethane	<2
Trichloroethylene	<2
1,1-Dichloroethylene	<2
1,1,1-Trichloroethane	<2
para-Dichlorobenzene	<2
Acetone	<50
2-Butanone (MEK)	<50
2-Hexanone	<50
4-Methyl-2-pentanone	<50
Chloroform	<5
Bromodichloromethane	<5
Chlorodibromomethane	<5
Bromoform	<5
trans1,2-Dichloroethylene	<2
Chlorobenzene	<2
m-Dichlorobenzene	<5
Dichloromethane	<5
cis-1,2-Dichloroethylene	<2
o-Dichlorobenzene	<2
Dibromomethane	<5
1,1-Dichloropropene	<5
Tetrachlorethylene	<2
Toluene	<2
Xylene(s)	<2
1,1-Dichloroethane	<5
1,2-Dichloropropane	<2
1,1,2,2-Tetrachloroethane	<5
Ethyl Benzene	<2
1,3-Dichloropropane	<5
Styrene	<2
Chloromethane	<5
Bromomethane	<5
1,2,3-Trichloropropane	<5
1,1,1,2-Tetrachloroethane	<5
Chloroethane	<5
1,1,2-Trichloroethane	<5

* Constituent Detection

VOC Constituents cont.

2,2-Dichloropropane	<5
o-Chloroluene	<5
p-Chlorotoluene	<5
Bromobenzene	<5
1,3-Dichloropropene	<5
1,2,4-Trimethylbenzene	<5
1,2,4-Trichlorobenzene	<5
1,2,3-Trichlorobenzene	<5
n-Propylbenzene	<5
n-Butylbenzene	<5
Naphthalene	<5
Hexachlorobutadiene	<5
1,3,5-Trimethylbenzene	<5
p-Isopropyltoluene	<5
Isopropylbenzene	<5
Tert-butylbenzene	<5
Sec-butylbenzene	<5
Fluorotrichloromethane	<5
Dichlorodifluoromethane	<5
Bromochloromethane	<5
Allylchloride	<5
2,3-Dichloro-1-propane	<5
Tetrahydrofuran	<50
Pentachloroethane	<5
Trichlorotrofluoroethane	<5
Carbondisufide	<5
Ether	<5

* Constituent Detection