

() INTER-OFFICE CORRESPONDENCE ()
REILLY TAR & CHEMICAL CORPORATION

US EPA RECORDS CENTER REGION 5



514478

931307

TO:
FROM: William R. Roder

OFFICE: Lab
DATE: May 2, 1979

SUBJECT: TRIAL PREPARATION:
HISTORY OF WELLS IN THE ST. LOUIS PARK AREA

Wells on the Plant Site:

Thirteen wells were on the plant site at time of purchase from the Minnesota Sugar Beet Co.

Twelve of the wells were shallow.⁽¹⁾ Attempts to use these shallow wells were unsuccessful, due to clogging of the well screens with sand and silt.⁽²⁾ Reports have placed the depth of the shallow wells at 50-60 ft.⁽³⁾ and from 100-200 ft.⁽⁴⁾ Based on the clogging information the wells are probably located in the middle and lower drift Aquifers (80 ft.) and not in the St. Peter sandstone; if the wells were 100-200 ft. deep.

The middle drift aquifer is a silt and clay formation, while the lower drift contains some sand. The St. Peter sandstone is a light yellow to white, well sorted quartzose sandstone.

One deep well was on the site. It was drilled in 1898 to a depth of 866 ft. to the Mt. Simon-Hinckley sandstone (a medium to coarse grained sandstone).⁽⁵⁾ The deep well was located in the southeast corner of the plant site 600 ft. from the pump house.⁽⁶⁾ The well had a 16" casing to 58 ft., 12" casing to 100 ft., and a 10" casing to 150 ft. was added in 1917. The well was plugged and sealed about 1933 on the advice of the McCarthy Well Co., in belief this would eliminate the problem the city of St. Louis Park was having with the taste of the water from their newly drilled well.⁽⁷⁾

An additional deep well was drilled 909 ft. into the Mt. Simon-Hinckley sandstone by the McCarthy Well Co. in 1918, close to the pump house. The well was cased with a 12" casing to 65 ft.⁽⁸⁾ In 1933 a 10" casing was added to a depth of 73 ft., an 8" casing to 260 ft. and a 4 1/2" casing to 373 ft., again on the advice of the McCarthy Well Co.⁽⁹⁾

The site well water was analyzed by Mr. T. E. Courtney of Reilly Labs, for phenol content, in May 1933, using the Gibb Method: The phenol concentrations were as follows:⁽¹⁰⁾

well with casing to only 65 ft. = 0.050 ppm
well with casing to 373 ft. = 0.020 ppm
water from peat bog N.W. of site = 0.010 ppm
Maywood boiler feed water = 0.040 ppm

() INTER-OFFICE CORRESPONDENCE ()

REILLY TAR & CHEMICAL CORPORATION TRIAL PREP.
(2) HISTORY OF WELLS

The well water was reanalyzed by Mr. Courtney in June, 1933. The phenol content was 0.030 ppm. (11)

The 0.010 ppm phenol concentration of the peat bog located northwest of the plant site indicates another source of phenol contamination, to the northwest of the plant site. Since the drainage of the area is to the south and east thru the plant site. (12)

The Chapin method was used in Nov., 1938 to determine the phenol concentration of the site well; no phenol was detected. (13) This well water had 352 ppm total solids.

A letter written by Mr. McLellan in 1940 indicates the site well water was never used for drinking purposes due to taste and odor. (14) *all wells on site? what about after 1940*

A new hydro-pneumatic pumping system was installed in the well in 1955. Tarry material caused this pump to fail in 1958. The plant personnel were of the opinion the well had become contaminated with tar to the 226 ft. level. Therefore, a packer was placed inside the 8" casing to a depth of 260 ft. (16) I could not determine the status of the site well after 1958 with the information I have available. Except, the plant office and showers were hooked up to city water in the early 1960's. (17)

The site well was opened in 1977 by the Barr Engineering Co. for testing. A tarry material was on the pipe to 40 ft. below the well head. (18)

The following phenol determinations have been made on the site well water over the years. (19)

Year	Lab.	Method	Phenol PPM
1933	Reilly	Gibb	0.020 - 0.050
1938	Reilly	Chapin	0.000
1968	Twin City Testing	Unk.	0.020
1977	Serco Labs	4-Aminiantipyrine	
	After 1 minute of pumping	100 gpm	0.020
"	15 "	" " "	0.011
"	30 "	" " "	0.008
"	100 "	" " "	0.005

The above phenol determinations indicate the phenol content of the site well water has remained constant over the years; since the coal tar creosoting operation began. The phenol content is above the allowable federal limits of 0.001 ppm phenol for drinking water. But, apparently the site well water always has been since the water was never used for drinking purposes.

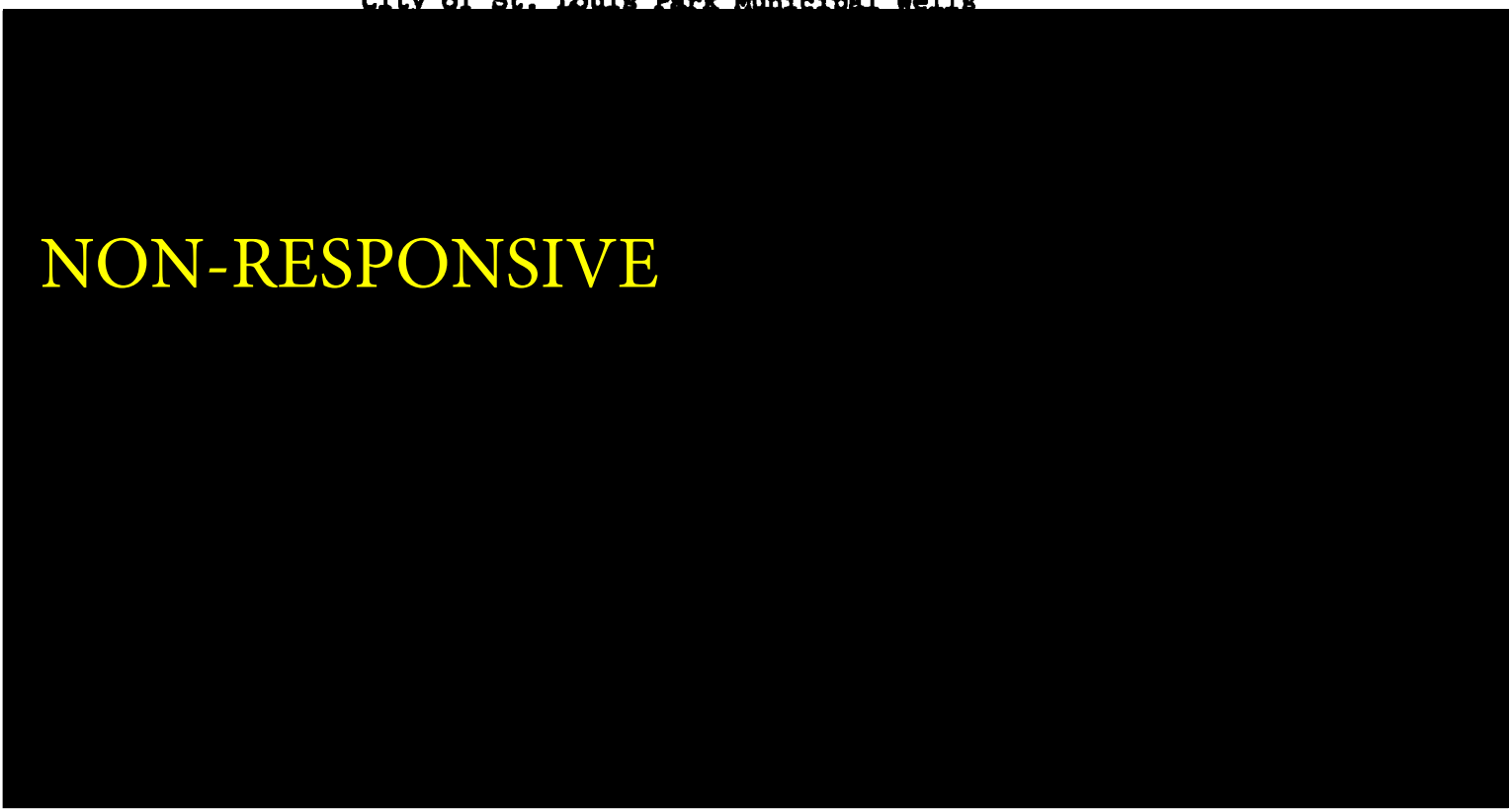
According to the Barr Engineering Report, the Mt. Simon-Hinckley formation is isolated

REILLY TAR & CHEMICAL CORPORATION
(3)

TRIAL PREP.
HISTORY OF WELLS

from the prairie du Chien-Jordan aquifer, except for recharge thru wells that provide a direct pathway between the Mt. Simon-Hinckley and the upper aquifer. (20) Therefore, if the site well was a direct pathway for contamination to the Mt. Simon-Hinckley aquifer, why didn't the phenol concentration of the site well water increase over the years?

City of St. Louis Park Municipal Wells



NON-RESPONSIVE

The following phenol concentrations have been reported over the years on the following city wells. (26)

ST. LOUIS PARK MUNICIPAL WELLS

NON-RESPONSIVE L

GEO. FORMATION	LOCATION FR. PLANT SITE	Phenol PPM						
		1946	1947	1948	1968	1969	1974	1977
St. Peter		-	-	-	-	0.014	0.002-0.035	-
St. Peter		-	-	-	0.002	0.012	-	0.002
Jordan	Non-responsive	0.100		0.005-0.070	0.008	0.014	-	-
Jordan		0.020	-	-	-	0.014	-	-
Jordan		-	0.007	0.015	0.0025	0.023	-	-
Jordan		-	-	-	-	0.014	0.002-0.013	0.002-0.05
Hinckley		-	-	-	0.000	trace	-	-
Hinckley		-	-	-	0.000	0.018	-	-
		-	-	-	0.000	0.018	-	-
Jordan		-	-	-	0.000	0.009	-	-

REILLY TAR & CHEMICAL CORPORATION

TRIAL PREP.
HISTORY OF WELLS

(5)

The phenol concentration of the city wells were determined to be less than 0.005 ppm by the Minnesota Dept. of Health on April 16, 1970. ⁽²⁷⁾

The above data shows no indication that the city's wells have become contaminated over the years. The upper aquifers appear to have no higher phenol content than the lower aquifers, and I find little evidence from this data that the wells to the south and east of the plant site are higher in phenol than the wells to the north or west.

However, according to the Barr Engineering Report, their information was not sufficient to explain the reason for the phenolic contamination of the city's St. Peter and Jordan wells located in the city's well field north of the Plant Site. Since their calculated flow time through the aquitards are on the order of 55 year through the siltstone stratum of the St. Peter and at least 34,000 years through the various aquitards between the Jordan and the Mt. Simon-Hinckley, thus under the assumed permeabilities and gradients it seems unlikely that the coal tar derivatives that are known to be present at the base of the glacial drift and in the platteville limestone could have traveled to the Prairie du Chien-Jordan through the siltstone stratum of the St. Peter, or to the Mt. Simon-Hinckley through the Eau Claire. ⁽²⁸⁾ However, the water level gradients are sufficient to transmit seepage from uncased wells to the City's wells in the St. Peter Aquifer. However, not enough time has elapsed for this to be ⁽²⁹⁾ the source of phenol in the city's St. Peter wells.

In the case of contamination of the city's Jordan wells, the computed water gradients indicate ground water could not be transmitted from the plant site to the City's Jordan well field north of the plant site. ⁽³⁰⁾

The Barr Report, also, stated the phenol concentration in the Mt. Simon-Hinckley wells on the plant site and the city well field could be attributed to movement of coal tar derivatives from the Mt. Simon-Hinckley well on the site to the City's Mt. Simon-Hinckley wells. ⁽³¹⁾ If this is the case why isn't the phenol concentration higher in the Mt. Simon-Hinckley aquifer, due to the direct pathway for contamination?

One attempt to explain the phenol concentration in the city's wells to the north of the plant site was by high volume pumping of the wells north of the site creates a cone of depression around the wells and corresponding a local reversal in the direction of ground water flow occur. ⁽³²⁾ However, the observed movement of ground

REILLY TAR & CHEMICAL CORPORATION

TRIAL PREP.
HISTORY OF WELLS

water in the St. Louis Park Area is in a southeasterly direction. (33)

Why, could not one explanation be that the phenol contamination, also have come from some source north or west of the plant site before the creosoting operation begun. Phenol Concentrations of 0.010 ppm (10,12) were found in a peat bog Northwest of the plant in 1933 and the plant site water has never been suitable for drinking. The time element of 55 years through the siltstone of the St. Peter could be explained, plus the reason for phenol in the city's well field to the north.

Polynuclear Aromatic hydrocarbons have also been reported in the city's well water. In 1977 the Barr Report showed no PNA in City Well #3 at detection limits of 0.030 ppm. However, a 1978 Minnesota Dept. of Health Report on PNA in the St. Louis Park drinking water reported the following wells should be abandoned due to high PNA concentrations.

Well # and Location	Direction Fr. Plant Site	Geo. Formation	1978 PNA ppm	1969 Phenol PPM
NON-RESPONSIVE	North	Jordan	0.000139	0.013
	North	"	0.000248	0.013
	North	"	0.001363	0.014
	North	"	0.001924	-

All the city wells were tested and only wells 10 and 15 exceed the allowable limits for PNAs in drinking water. All the wells with high PNA concentrations were in the Jordan aquifer and to the north of the plant site.

Again, why not explore a source of contamination to the north or west of the plant site before 1900. We found phenol north and west in 1933, the time element can be explained, through the St. Peter and this could be the reason the Jordan Wells to the north are contaminated, with phenol & PNA. Since the Barr Engineering report states the Jordan wells north of the plant site, could not be contaminated with phenols from the plant sites ground water. (36)

Residential and Commercial Wells in the St. Louis Park Area

The first written complaint by a resident in the plant site vicinity due to a phenol taste in their well water occurred in 1938.

The Minnesota Dept. of Health in 1938 sampled and analyzed for phenol, two residential wells and one commercial well. All located east of the plant site. (37)

REILLY TAR & CHEMICAL CORPORATION

(7)

TRIAL PREP.
HISTORY OF WELLS

Location of Well	Geo. Formation	Phenol PPM
NON-RESPONSIVE	lower drift	0.221
	"	12.30
Hedberg-Friedheim Gravel Pit	Jordan	0.00818

The commercial well was drilled originally to the St. Peter and no tarry taste present, however, after extending the well to the Jordan, a tarry phenolic taste was observed. (38)

The Prestilite Co. also had a 300 ft. well (Prairie du Chien formation) with a phenolic taste to the water. They were reported to be able to remove the taste with some type of filter. (39)

NON-RESPONSIVE

Ole Peterson, the creosoting foreman at the time, stated wells in the area had had the phenolic taste and odor before Reilly purchased the plant site. Jim Smith of Mpls. Gas and Light back up Mr. Peterson's statement. (41)

All the wells were sampled and analyzed by the State Board of Health, and were passed as safe. (42)

Most of the residential and commercial wells in the area which were drilled to the Platteville have now been abandoned. (43)

Phenol analysis of various residential and commercial wells in the area over the years have been tabulated. (44)

why (8)

RESIDENTIAL AND COMMERCIAL WELLS

Well Co. & Location	Geo. Formation	Direction of Site	Phenol PPM					
			1938	1968	1969	1974	1976	1977
NON-RESPONSIVE	Jordan	E	0.00818	-	-			
	Prairie du Chein	S	-	-	0.028	0.002-0.004	0.002	0.002-0.03
	St. Peter	E			0.023			
	Prairie du Chein	SE		0.008	0.020	<0.002-0.007	<0.002	
	St. Peter	SE				1.0 - 1.4	0.14-0.17	0.390
	Jordan	E					<0.002	
	Jordan	SE				<0.002-0.009	<0.002	
	Jordan	E				<0.002-.017	<0.002	
	Jordan	SE					<0.002	
	St. Peter	SE					<0.002	
	lowerdrift	E		0.221				
	"	E		12.3				

REILLY TAR & CHEMICAL CORPORATION

TRIAL PREP.
HISTORY OF WELLS

(9)

Only the Midco Register Co., formerly Robinson Rubber Co. had a phenol content considerably higher than found in any of the city wells or commercial wells. Again the well is located in the St. Peter and contamination would have to be by a direct pathway to the St. Peter aquitard.⁽⁴⁵⁾ Could the well have been contaminated by the former owner, the Robinson Rubber Co. One commercial well has been analyzed for PNA's, the Flame Industry well located south of the plant site at Lake St. and Taft Ave. The well is drilled to the Prairie du Chien aquitard, and no PNA's were detected with a detection limit of 0.03 ppm.⁽⁴⁶⁾

Monitoring Wells:

Monitoring wells were drilled by the Barr Engineering Co. for their investigation of the area.

The following phenolic concentrations were obtained.⁽⁴⁷⁾

Monitoring Well #	Formation	Direction Fr. Plant Site	Phenol PPM	
			1976	1977
W-1	Platteville	NE	<0.002	<0.002
W-2	Middle Drift	N	<0.002	<0.002
W-3	Middle Drift	N on Site	<0.002	-
W-5	Middle Drift	SE Corner Site	0.153	0.035-0.022
W-6	"	SW Corner Site	0.043	0.050-0.19
W-7	"	West	<0.002	
W-8	"	South	<0.002	<0.002
W-9	Middle Drift	SE	3.00	1.10-0.60
W-10	"	SE	0.002-0.004	-
W-11	"		0.004-0.023	-
W-12	"	SE	0.014	-
W-13	"	SE	-	56-4.8
W-14	St. Peter	SE	-	<0.0068-0.002
W-15	Lower drift	SW Corner Site	-	0.028-0.037
W-16	Lower drift	S		0.002-0.004
W-17	Lower drift	SE		0.340-0.032

REILLY TAR & CHEMICAL CORPORATION

TRIAL PREP.
HISTORY OF WELLS

(11)

The monitoring well data does indicate the higher phenol content is in the south east corner of the plant site and across the property line to the southeast between Walker and Lake St., with the higher concentration in the glacial drift.

Monitoring wells 9,13,14 and 17 were analyzed for PNA's. No PNA's were reported in well 14 at detection limits of 0.03 ppm. Well 17 had a PNA concentration of 1.7 ppm. (48)

Well 17 is located the farthest from the plant site approximately (1000 ft.) and drilled into the lower drift. Why, it has a higher PNA concentration than wells 9 and 13 which are closer to the plant site and drilled only to the middle drift was not explained. Well 14 is in the same area, but drilled to the St. Peter.

Other Wells

The following is a list of other reported wells in the St. Louis Park and plant site area. No phenol or PNA determinations have been made on these wells. (49)

Wells identified by Sunde (1974) in his survey of well logs, but not located in the Barr Engineering field survey: (47)

NON-RESPONSIVE

Strom Block Co.	Hinckley	cased to 1st bedrock
Strom Block Co.	St. Peter	"
Black Top Service Co.	"	"
	Jordan	cased to the St. Peter
	"	"
		and may be sealed

Wells not identified by Sunde in 1974 survey, but located during field survey:		
Mill City Plywood	lower drift	tarry taste, no
Lakeland Door Co.	Platteville	no tarry taste, not in use
Ace Mfr. Co. 3825 Edgewood	No log available	
	160 ft.	no smell or taste
Methodist Hospital	St. Lawrence	Cased to Jordan

NON-RESPONSIVE

Wells for which logs were found but had not been previously reported.		
	St. Peter	Cased to Platteville
	Platteville	
Terry Excavating 3326 Republic	112 ft.	Cased to 1st bedrock

This report was based on information gathered from correspondence between the Republic Creosoting plant at St. Louis Park, Minn. and the main office of Reilly Tar and Chemical. Correspondence between the above offices and the City of St. Louis Park and various offices of the State of Minnesota. Plus the following reports to

REILLY TAR & CHEMICAL CORPORATION

(12)

TRIAL PREP.
HISTORY OF WELLS

the MPCA:

Barr Engineering Report June, 1977

Eugene A. Hickok & Associates Report "Ground Water Investigation Program at
St. Louis Park, Minn. progress Report 1.
Sept. 1969Minn. Dept. of Health - Division of Environmental Health Section of Health Risk
Assessment" Health Implications of Polynuclear Aromatic
Hydrocarbons in St. Louis Park Drinking Water. Nov. 1978

Very truly yours,

William R. Roder

REILLY TAR & CHEMICAL CORPORATION TRIAL PREP.
(13) HISTORY OF WELLS

References and Documentation Used in Report

1. lx 17-10-29 A. E. Larkin
2. lx 17-11-3 A. E. Larkin
3. lx 17-11-3 " "
4. lx 17-9-5 " "
5. lx 17-10-5 " "
6. lx 17-10-16 " "
7. lx 33-4-4 " "
- lx 34-3-26 W. J. McLellan
8. lx 17-10-29 A. E. Larkin
- lx 17-11-5 A. E. Larkin
- lx 17-11-13 " "
- lx 17-11-26 McCarthy Well Co.
- lx 17-12-10 A. E. Larkin
9. lx 33-4-4 " "
- lx 33-4-8 " "
- lx 33-5-10 R. L. Rademacher
10. lx 33-5-23 T. E. Courtney
11. lx 33-6-22 " "
12. lx 33-5-18 R. L. Rademacher
13. lx 38-11-18 T. E. Courtney
14. lx 40-10-14 W. J. McLellan *have this one?*
15. lx 55-4-28 H. L. Holstrom " " "
16. lx 58-3-5 H. L. Holstrom " " "
17. lx 62-7-18 H. L. Finch " " "
18. Barr Engineering Report 1977-6 page III-34
19. lx 33-5-23 T. E. Courtney
- lx 38-11-18 " "
- lx 68-6-24 Twin City Testing Lab.
- Barr Engineering Report 1977-6 page III-34
20. Barr Engineering Report 1977-6 page IV-19
21. lx 33-4-4 A. E. Larkin " " " ?
22. lx 33-7-12 R. L. Rademacher
23. lx 38-6-3 A. E. Larkin
24. E. A. Hickok & Associate Report 1969-9 page 5
25. E. A. Hickok & Associate Report 1969-9 page 17
26. E. A. Hickok & Associate Report 1969-9 pages 5-6
- Barr Engineering Report 1977-6 table #6
27. MCPA Report 439 1970-4 page 2
28. Barr Engineering Report 1971 -6 page IV 20
29. Barr Engineering Report 1971 -6 page VII 3-4
30. " " " " " "
31. " " " " " "
32. E. A. Hickok & Assoc. Report 1969-9 page 13
33. Barr Engineering Report 1977-6 page VII-1
34. " " " " page III 33-34
35. Minnesota Dept. of Health "Health Implications of Poly nuclear Aromatic Hydrocarbons in St. Louis Park Drinking Water" 1978-11 Table I

REILLY TAR & CHEMICAL CORPORATION

TRIAL PREP
HISTORY OF WELLS

(14)

36. Barr Engineering Report 1977-6 page VII 3-4
 37. Minn. Dept. of Health Division of Sanitation Report or Investigation of Disposal of Wastes at the REpublic Creosoting E. St. Louis Park, Minn. 1938-5
 38. Same as 37
 39. " " "
 40. 1x 40-10-14 W. J. McLellan " " "
 41. 1x 40-10-14 " " " " "
 42. ~~1x 40-10-14 " " "~~
 43. E. A. HICKOK and Assoc. Report 1969-9 page 17
 44. Same as 37
 E. A. Hickok & Assoc. Report 1969-9 Table I & II
 Barr Engineering Report 1977-6 table #7
 45. " " " " page IV - 15
 46. " " " " page III 33-34
 47. " " " " table #5
 48. Barr Engineering Report 1977-6 page III 33-34
 49. " " " " page III 22-24

Sample: 1x 17-10-29 A. E. Larkin
 1x = Reilly Tar & Chem. Co. correspondence
 17 = year 1917
 10 = month
 29 = day
 A. E. Larkin writer.

WR/jr