

cc: Mr. R.C. Collins
Mr. M.C. Goldsmith
Mr. A.D. Miller

Proposed Dump Site

July 13, 1960

TO: MR. HANS WESSEL - ENGINEERING DEPT. - 207-1

FROM: JOHN A. BROWN - GEOLOGY DEPT. - 27-2

Reference: Geology Dept. Report #60-10

This is to acknowledge your request of July 8th concerning the geology and subsurface drainage of a new proposed dump site.

The proposed 240 acre site is located in the southern one-half of section 35, T27N R21W, or approximately one mile north of Cottage Grove in Woodbury TWS, Washington County. This area is principally agricultural with the land parcels averaging approximately 100 acres each. A few commuters have taken over some of the farms as well as building suburban homes on a few of the small nearby lakes.

As we understand it, this property has been secured by a 30-day earnest money contract between Earl Ryan (of Terminal Warehouse) and the present land owner, a Mr. Dahm. Mr. Ryan is holding the papers on this property in his own name to minimize publicity. It is further understood that Terminal Warehouse Co. will secure written permission from the Woodbury TWS Committee for this proposed land usage. Terminal Warehouse also will engage people for the test drilling.

We also understand that this proposed dump site will or may be used by all plants in the St. Paul area. There will be wet acid and phenol waste as well as dry waste material. At this time there are no plans to construct a drainage pond or to provide burning facilities.

The wet waste material will be dumped in long trenches and allowed to seep into the ground and as soon as one area becomes saturated, it will be covered over and another trench dug. The dry waste material will be buried.

Geologically speaking, the general area has a typical glacial ground moraine topography with a maximum relief of about 100 feet. The principal bed rock formations underlying this area are the St. Peter sandstone intermittently covered with Plattville limestone. These bedrock formations are overlain with 30 to 80 feet of glacial drift. The St. Peter sandstone is one of the aquifers in the Twin City area. It is not used too extensively in the downtown metropolitan areas but is used to a large degree for shallow wells in the rural areas. There are undoubtedly numerous wells in Cottage Grove, one mile to the south, which obtain their domestic water from the St. Peter sandstone. This

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Trial Exhibit 3

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aquifer is not protected by a shale or a limestone layer over the top except on the very eastern edge of the proposed site. In general, this area lies on the west flank of the Afton anti-cline and this sandstone formation dips slightly in a westerly direction and it is felt that the principal water seepage would be along that line towards the center of the Twin City basin.

Along the eastern edge of the proposed site, there is a band of Plattville limestone which is probably not over 20 feet thick overlying the St. Peter sandstone. This limestone also dips in a slight westerly direction. From our preliminary investigation it appears as if there is 10 to 20 feet of overburden or drift along the west edge of the property and there is considerable gravel and reworked drift as you proceed into the valley or pocket near the center of the site (see map). On the eastern 80 acres there could well be 50 to 75 feet of glacial drift. The exact depth of the location of these formational contacts will have to await boring information. From a geological standpoint this area would not be ideal in our opinion; however, from the other merits of this location we feel it should satisfy our demands. If there is a large volume of acid waste dumped, it would be better if the area were immediately underlain by a thick formation of limestone or dolomite. This would help neutralize the acid before getting into the ground water. Since Cottage Grove is at least a mile away, it is felt that the water would have sufficient distance to purify itself. Other wet wastes, not neutralized nor deposited within rock or soil pore spaces, will eventually reach the water table and pollute domestic wells.

It appears that the ground water elevation in this area is approximately 860 feet above sea level and our principal dumping area will be at about 900 feet. Therefore, waste seepage will travel considerable distance before reaching the water table.

Eventual pollution of adjacent domestic wells will depend upon time, geologic conditions and rate of wet waste dumping. When waste seepage reaches the water table certain solids by that time may be rendered harmless while others will remain to pollute wells. The geologic conditions that will affect pollution are location and thickness of the limestone cap over the St. Peter sandstone, to neutralize acids and prevent early contamination of aquifers; direction of dip of beds and direction of flow of the ground water; and amount and porosity of glacial drift. Five or six borings will answer most of these questions. The other factor, rate of dumping, will hasten or prolong pollution. Degree of pollution will in turn indicate the time when dumping should cease. It may be that other factors will signify a time to abandon the site prior to maximum pollution. These factors would be housing developments, public relations, and new zoning regulations.

The zoning problem alone merits a good deal of attention. Low level land usage such as dumps, and gravel pits generally brings condemnation from nearby residents and population centers. This cannot be over-emphasized after past experience with our eastern zoning problems.

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It is imperative that we have absolute freedom to use the land for dumping before purchase and use. After this is obtained, the land purchased and holes bored, the geologic conditions should be utilized to plan dumping in such a manner as to realize the longest possible life for the dump with the least possible aquifer pollution.

In conclusion, we would like to recommend that four to six borings be made along an east-west line in approximately the center of the property (see map). This will give information on the formational contact between the St. Peter sandstone and the Plattville limestone and the exact depth of glacial drift. It is felt that if at all possible, our wet waste trenches should be constructed over the Plattville limestone bedrock. Observation wells should be maintained and periodic analyses made to determine the extent of pollution. These wells may be the wells already on the property, cased exploratory bore holes, neighboring wells or wells drilled expressly for the purpose. These would give us information on rate of pollution and allow us to predict a time to cease dumping. From our preliminary survey we feel that this area will make a suitable dumping site.

This report is a result of field survey and study by the Geology Department.

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