The "Nodak" Sewage Disposal System

by Richard L. Witz[1] and J. Clayton Russell[2]

Observation and experience with sewage disposal systems in the Red River Valley indicated the impossibility of installing a satisfactory disposal field or bed using gravity from the septic tank to the field. The flat soil with a tight texture plus a high water table during many months of the year indicate that a better disposal field was needed. By putting the disposal field on top of the ground it is possible to obtain better purification of the effluent as well as making a field easily accessible for rebuilding when required. Two suggestions are shown in Figures 6 and 7 for this type of disposal field.

To make this type of disposal field possible, it is necessary to cover it with straw to prevent freezing in winter and to provide a pump to carry the effluent from the septic tank to the field. Since this effluent is a practically clear liquid, the pump does not need to be a special type. An inexpensive centrifugal type of pump is satisfactory except where the self-priming feature may be necessary as shown in Figure 2. Shrubbery and trees around the disposal field will aid in the absorption of moisture and help provide winter protection from freezing.

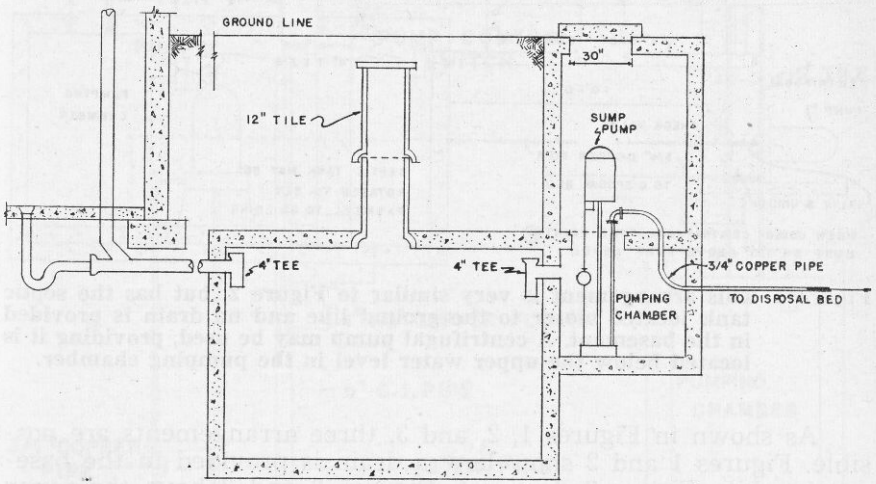

Figure 1. This shows the system as installed for the farm house near the sheep farm on the N.D.A.C. farm. This is adapted where the septic tank is located some distance from the house. The effluent as it leaves the digestion chamber (the large tank) is pumped to the disposal field. The arrangement is shown using a basement drain but could be installed closer to the service, providing the drain is not considered essential.

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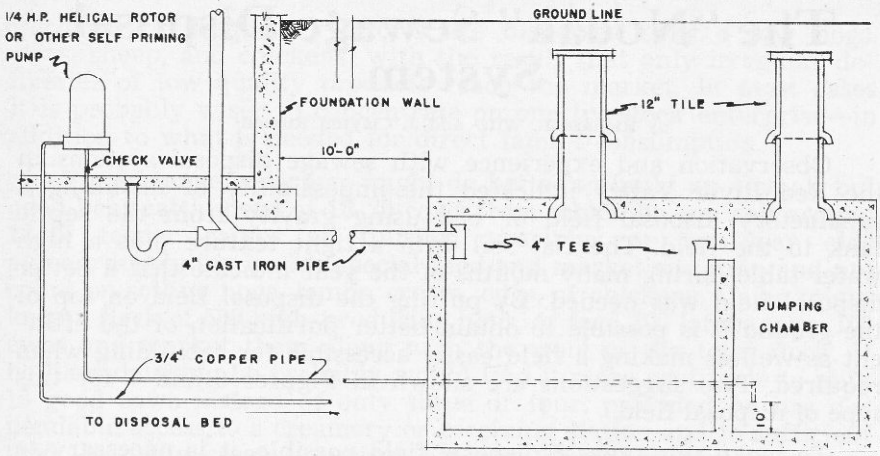

Figure 2. A new arrangement which locates the pump in the basement to make the pump easily accessible for servicing. The pump should be a self-priming pump; such as, a helical rotor, a self-priming centrifugal, or a piston pump. See Figures 4 and 5 for methods to control the pump.

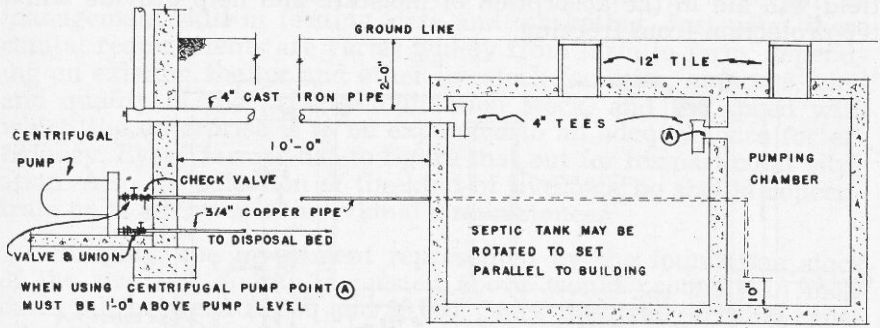

Figure 3. This arrangement is very similar to Figure 2, but has the septic tank located closer to the ground line and no drain is provided in the basement. A centrifugal pump may be used, providing it is located below the upper water level in the pumping chamber.

As shown in Figures 1, 2, and 3, three arrangements are possible. Figures 1 and 2 show how a drain is provided in the basement, while Figure 3 does not. Figures 2 and 3 have the pump located in the basement for easy accessibility and drier operating conditions. Where the septic tank is some distance from the house, the plan in Figure 1 is satisfactory. In any of the arrangements, the pumping chamber may be separate from the septic tank which permits this system to be adapted to the present septic tank providing it is in usable condition.

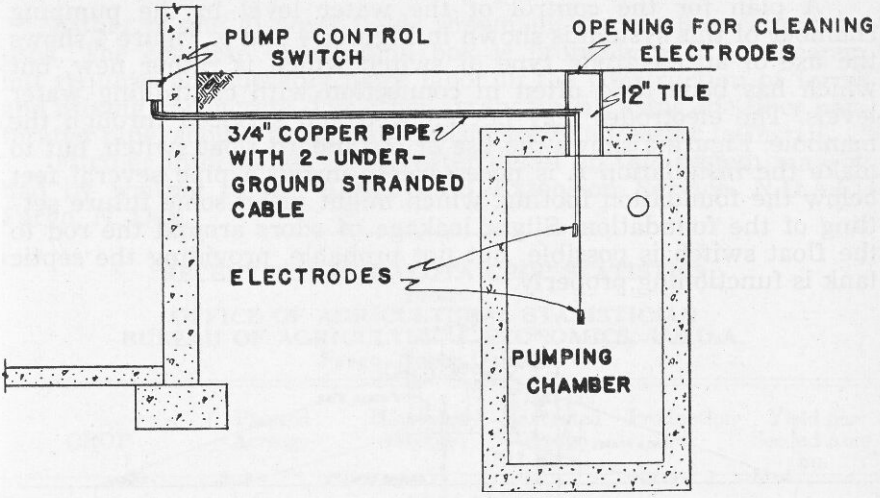

Figure 4. A practical method of providing a control for the pump. The level in the pumping chamber is controlled by two electrodes. This type of control is available through most plumbing supply houses. The electrodes may be cleaned by raising them out through the cleaning opening.

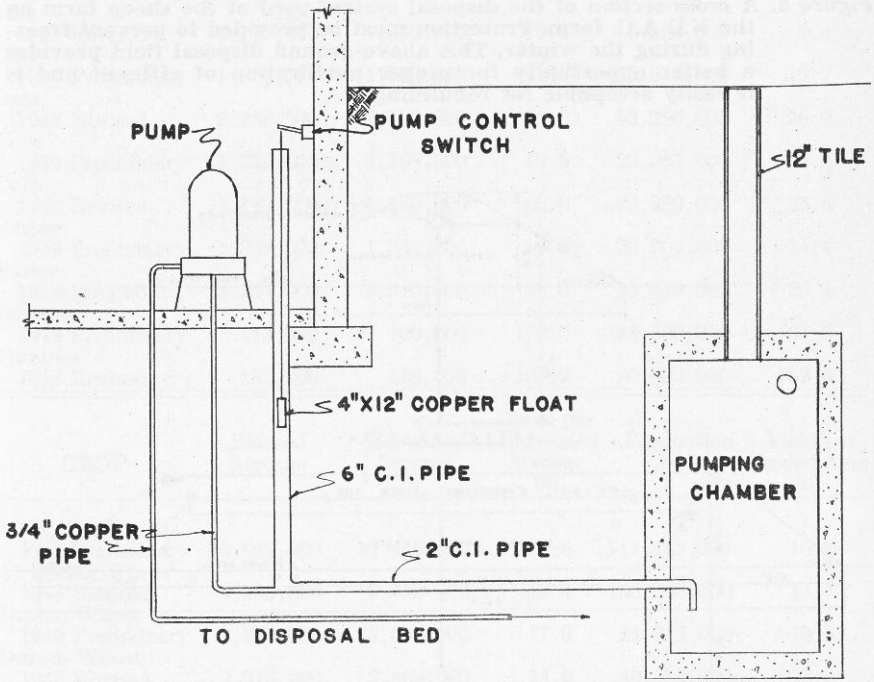

Figure 5. Another method of providing a means of controlling the pump using a regular float switch. This is a very satisfactory method, but the installation will usually require a deep trench under the foundation for the placement of the pipe to the float.

A plan for the control of the water level in the pumping chamber of this system is shown in Figures 4 and 5. Figure 4 shows the use of an electrode type of switch which is rather new, but which has been used often in connection with controlling water levels. The electrodes may be removed and serviced through the manhole. Figure 5 shows the use of a standard float switch, but to make the installation it is necessary to install a pipe several feet below the foundation footing, which might mean some future settling of the foundation. Slight leakage of odors around the rod to the float switch is possible, but not probable, providing the septic tank is functioning properly.

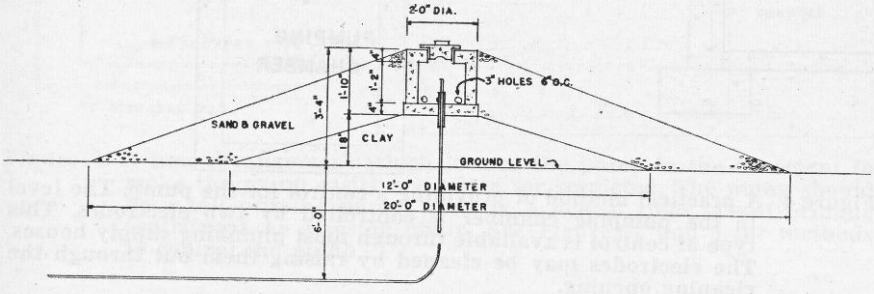

Figure 6. A cross-section of the disposal system used at the sheep farm on the N.D.A.C. farm. Protection must be provided to prevent freezing during the winter. This above-ground disposal field provides a better opportunity for proper purification of effluent and is is easily accessible for rebuilding.

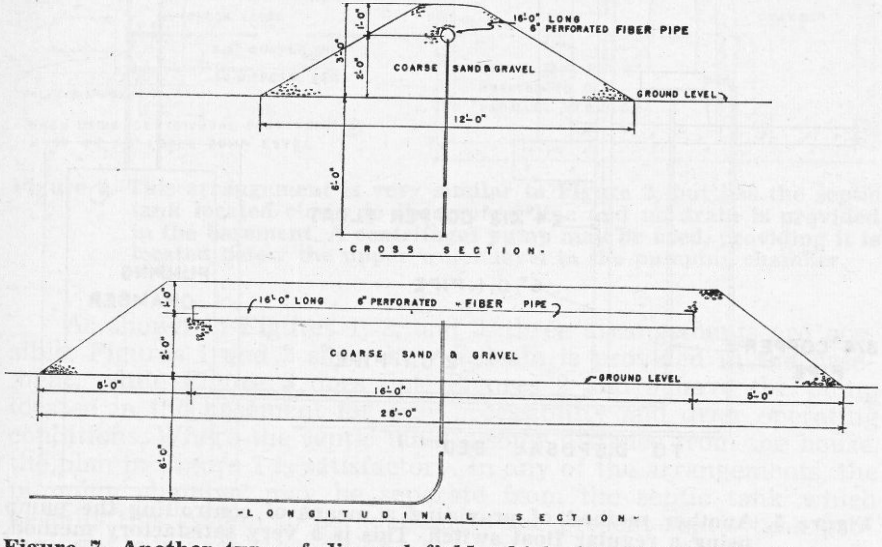

Figure 7. Another type of disposal field which does not require the construction of a distribution box but uses perforated pipe.

Either of the disposal fields shown in Figures 6 or 7 may be used. The concrete distribution box is probably a little cheaper, but requires considerably more labor in the construction of forms and mixing of concrete. The other arrangement, using the fiber perforated pipe, should be equally satisfactory and easier to install.

Further information and greater detail on this system may be had by writing to the Agricultural Extension Service, N.D.A.C., Fargo, N. Dak.

RECENT NORTH DAKOTA CROP STATISTICS
From
OFFICE OF AGRICULTURAL STATISTICIAN
BUREAU OF AGRICULTURAL ECONOMICS, U.S.D.A.
Fargo, North Dakota

CROP	Planted Acreage	Harvested Acreage	Yield per Harvested Acreage bu.	Production bu.	Yield per Seeded Acre bu.
Rye 1949 Preliminary	263,000	229,000	12.0	2,748,000	10.4
Rye 1948 Revised	461,000	401,000	12.0	4,812,000	10.4
Flax 1949 Preliminary	1,851,000	1,754,000	7.5	13,155,000	7.1
Flax 1948 Revised	1,715,000	1,639,000	10.0	16,390,000	9.6
Oats 1949 Preliminary	1,858,000	1,700,000	21.5	36,550,000	19.7
Oats 1948 Revised	2,238,000	2,152,000	28.0	60,256,000	26.9
Corn 1949 Preliminary	1,239,000	1,198,000	19.5	23,361,000	18.9
Corn 1948 Revised	1,147,000	1,130,000	26.0	29,380,000	25.6
Barley 1949 Preliminary	1,852,000	1,663,000	16.0	26,608,000	14.4
Barley 1948 Revised	2,724,000	2,640,000	21.0	55,440,000	20.4
Potatoes 1949 Preliminary	113,000	109,000	170.0	18,530,000	164.0
Potatoes 1948 Revised	132,000	125,000	160.0	20,000,000	152.0

CROP	Planted Acreage	Harvested Acreage	Yield per Harvested Acreage bu.	Production bu.	Yield per Seeded Acre bu.
All Spring Wheat 1949 Preliminary	10,942,000	10,466,000	10.6	111,439,000	10.2
All Spring Wheat 1948 Revised	9,983,000	9,820,000	14.4	140,958,000	14.1
Durum Wheat 1949 Preliminary	3,236,000	3,092,000	11.0	34,012,000	10.5
Durum Wheat 1948 Revised	2,913,000	2,863,000	14.0	40,082,000	13.8
Other Spring Wheat 1949 Preliminary	7,706,000	7,374,000	10.5	77,427,000	10.0
1948 Revised	7,070,000	6,957,000	14.5	100,876,000	14.3