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### Historical Perspective on Public Drainage

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#### **Our Premise**

- Agricultural drainage developed in Minnesota before the turn of the 20<sup>th</sup> (1900) century and has become necessary in many areas for crop production.
- Landowners have acquired property rights in drainage systems that drain almost one-third of Minnesota's agricultural production area. Drainage systems have been traditionally operated and constructed by county authorities under the state drainage code.
- Today, a tangled web of state and Federal jurisdiction over agricultural drainage threaten drainage rights and has left drainage authorities and practitioners confused about the proper procedures to be followed to construct drainage projects.









### Drainage Generally

- Laws that allow and restrict agricultural drainage have focused on the property rights of individuals desiring to drain land and the property rights of individuals and the public affected by the drainage.
- Drainage under the common law is based upon allowing a reasonable discharge of water that does not damage a nonconsenting landowner's property. (reasonable use law)
- Largescale drainage projects, by their nature, can only be established under statutory drainage provisions. These provisions provide financing and construction over lands to adequate outlets.
- Property owners are assessed the costs of construction based on benefits of drainage to their property. Property owners have acquired drainage rights in drainage systems that presently drain about fourteen million acres of land.





#### **Current Court Perspectives on Drainage Laws**

 "Minnesota's laws pertaining to drainage systems are a complex matrix adopted with the intent of reclaiming agricultural land by disposing of excess water that renders the land untillable....and fairly allocating the costs among benefitted landowners."

In re Improvement of Murray County Ditch No. 34, 615 N.W.2d 40, 45 (Minn. 2000).







#### **Common Law Perspective on Drainage**

- Common-enemy rule to reasonable use:
  - Early courts viewed surface water as a common enemy that each landowner "may get rid of as best he may." Later, courts limited each person's "common-law right to improve and enjoy his own property to its fullest extent by the requirement that he use reasonable care in disposing of surface water"
  - Sheehan v. Flynn, 61 N.W.2d 462, 463 (Minn. 1894).
- Reasonable use
  - In determining liability for the obstruction or diversion of minor natural and artificial drainways or channels for the drainage of waters this court has uniformly applied the law relating to surface waters. Since Sheehan v. Flynn, Minnesota has adhered to the reasonable-use rule.
  - Under this rule— Each possessor (of land) is legally privileged to make a reasonable use of his land, even though the flow of surface waters is
    altered thereby and causes some harm to others. He incurs liability only when his harmful interference with the flow of surface water is
    unreasonable. The issue of reasonableness or unreasonableness is a question of fact to be determined in each case upon a consideration of all
    the relevant circumstances, including such factors as the amount of harm caused, the foreseeability of the harm on the part of the possessor
    making the alteration in the flow, the purpose or motive with which he acted, and others.
  - Collins v. Wickland, 251 Minn. 419, 425, 88 N.W.2d 83, 87–88 (1958)
- What is "reasonable use"
  - The drainage, diversion, or impoundment was reasonably necessary
  - The utility or benefit accruing the drained land reasonable outweighs the gravity of harm resulting to the burdened land
  - The landowner took reasonable care to avoid unnecessary injury to the burdened property
  - The landowner reasonably improved natural systems, or implemented reasonable artificial systems, of drainage



#### Where are we today?

- Drainage of wet soil for agricultural production has continually developed since Minnesota became a state.
- The state has fostered initiatives to promote agricultural drainage and has constructed a substantial number of drainage systems that have been turned over to the county drainage authorities.
- The state has aided drainage development by providing comprehensive financing, construction, and maintenance procedures that allow property owners to construct and maintain drainage systems through drainage authorities.
- Over a century of drainage development has vested drainage rights in the property owners of the fourteen million acres of land in drainage systems.



#### Pre- and Early Statehood

- Surveys of Minnesota before statehood reported more than ten million acres of federally-owned wet soils, commonly known as swamplands, within its boundaries.
- The federal government granted the swamplands within Minnesota to the state upon admission to the United States. Although the grant was conditioned on the proceeds from the swamplands being used to drain the land, the condition was ignored.
- Over 2,800,000 acres were granted to aid railroads, state institutions, a slack water navigation company, a seminary, and education and charitable institutions.
- Very little of the swamplands that were granted or retained were drained until large drainage projects were organized.
- A lawsuit was brought by the United States in 1922 and later dismissed to recover the swamplands granted by the federal government because proceeds of the swamplands were not used for their drainage.







### Early Agricultural Settlement

- Agricultural settlement in Minnesota began in the 1850's in the southeastern area of the state where settlers first arrived by river.
- Railroad construction from 1860 to 1890 stimulated further settlement and the establishment of towns.
- Between 1890 and 1900 cultivation advanced rapidly westward and northward to western Minnesota and the Red River Valley.
- The Red River lands had fertile soil and were well suited for wheat production but a flat area inhibited drainage to the Red River.
- A plan was developed to construct and finance large-scale drainage in the Red River Valley by assessing the lands benefited. The resulting drainage legislation, which has been emulated for over one hundred years, required a petition of landowners for initiation, and financed the drainage project by selling bonds, and assessing the costs to benefited landowners.



#### State Drainage Commission

- The state began an active drainage role in 1897 when it designated a three-member board of commissioners to oversee drainage.
- A topographical and drainage survey was ordered, which concluded that about 2,500,000 acres of state land was excessively wet and should be drained.
- The state drainage commission began constructing drainage systems that were close to railroad terminals and trade centers to directly benefit agriculture.
- An additional benefit of drainage ditches was construction of roadways on the fill excavated from drainage ditches.
- By 1915, seventy-six state ditches had been built and the state had appropriated over one million dollars to drain state lands.







#### Turn of the Century Boom (9 Million Acres)

- Most of the farmable land in Minnesota had been settled by the late nineteenth century, and additional land for the state's growing population was available only by draining marshes and poorly drained soils.
- Most counties had established some county drainage systems by 1897. State officials encouraged drainage of lands too wet to farm without drainage.
- Surveys and drainage plans of the entire state were ordered and were to be filed with county auditors.
- The drainage laws enabled drainage with as few as one person petitioning the district court.
- All land, except state-owned land, could be assessed for the costs of constructing a drainage system, whether settled or not.
- State law allowed the formation of state, judicial, county, and township drainage systems, with the cost of the drainage work assessed against the benefited property. Favorable drainage laws and a demand for farmland resulted in nine million acres of land being drained from 1900 to 1915.



## State Drainage Commission Touts its Accomplishments (@1913)

- About 575 miles of roadway were constructed in conjunction with state ditches initiated by 1913.
- The state drainage commission usually constructed drainage ditches as main outlet channels through land that should receive additional drainage. However, in Roseau and Kittson Counties local drainage systems were constructed by the state to drain state land to be sold to the public.
- In 1912, the state investment of \$30,000 to drain 18,000 acres was expected to return \$450,000 to the state by selling the drained land. In most areas it was anticipated that counties would construct drainage systems to make the land suitable for cultivation.
- The state drainage commission made regular inspections of the drainage systems, but the counties had the duty to maintain and repair them. The state paid for drainage construction and assessed the costs to the benefited property. The public supported state drainage system construction and the state commission received few, if any, complaints, even concerning the assessments.







#### State Promotion of Swampland Drainage

- "We are convinced that the time has arrived when it is imperatively necessary for the state to
  pursue a vigorous policy in dealing with this question [drainage of swamplands]. We respectfully
  recommend that the reclamation of the state swamp lands be continued on a more extensive
  scale and that a liberal annual appropriation be made for carrying on this work."
- "Drainage work should be continued with increased energy both on the part of the state and under county management .... The wetland areas of the state should all be transformed to production lands as rapidly as possible."
  - Letter of Transmittal from Governor John A. Johnson, State Auditor Samuel Iverson, and Secretary of State Peter E. Hanson to the Minnesota Legislature (Jan. 1, 1907).



# Early 1900s Anecdotes on the Emphasis on Drainage

- Act of April 25, 1907, ch. 448, § 3, 1907 Minn. Laws 639, 643, allowed petitioners to transfer their petition to a district court if the county board obstructed or delayed proceedings or refused to establish a drainage system.
- Federal land that was benefited could be assessed under the Volstead Act and land held by railroad companies was assessed in the same manner as private land.
- Laws in 1909 provided for state ditches, §§ 1-43; judicial and county ditches, §§ 44-125; and town ditches, §§ 126-
- 63.
- The resulting drainage activity in 1910 is indicated by over 60 ditching machines, most of which were floating dredges, operating in the state and 15 clay tile factories and other concrete tile factories, which could hardly keep up with the tile demand.
- In southern Minnesota, about two-thirds of the drainage constructed was by tiling.







#### Dark Clouds on the Horizon

- Major floods in 1916 raised the issues of whether open ditches should be used in drainage and whether drainage caused floods.
- Floods of 1918 and 1919 severely damaged agricultural lands. Large tracts of land in the watersheds of the Minnesota and Red River Valleys, Red Lake and Roseau Rivers, were severely damaged.
- An investigation of the flood was ordered by the legislature. Although most drainage systems, covering about 24 percent of the land area, were constructed to prevent land from being overflowed by stream floods.
- Little, if any, attention was given to the ability of downstream systems to handle the drained water and the legislature realized the need for flood control organized on a watershed basis and in 1919, authorized establishment of drainage and flood control districts, and drainage and conservancy districts.
- In response to the need for flood control, the Minnesota Valley and Lake Traverse Bois
- Des Sioux Drainage and Flood Control Districts were formed in 1917.



#### Climate Cycle/War/Economy Slows Aggressive Drainage

- Although the early years of statehood resulted in unprecedented drainage, events after 1915 brought drainage to a dramatic halt.
- Floods from 1916 to 1919 and tile failures raised questions about drainage benefits and, in 1921, the annual amount of rainfall dropped below normal and remained below normal almost continuously until 1938.
- Drainage construction and proceedings practically stopped during World War I due to a shortage of labor, supplies, and financing problems.
- Rising postwar farm values and farm commodity prices and declining drainage construction costs resulted in new drainage proceedings and an anticipation of drainage being resumed at pre-war levels.
- By 1923, however, farm commodity prices had dropped sharply and the anticipated rebound stalled.



#### 1915-1940

- The economical large-scale drainage had been completed and the agricultural depression eliminated the need for new agricultural land to be reclaimed by drainage. As a result, drainage work was directed towards improving existing farmland.
- As the drought developed and the agricultural and national economic depression resulted in farm products priced below the cost of production, drainage work ceased.
- Drainage systems fell into disrepair, filling up with sediment, brush, and trees.
- At the time when drainage systems were being neglected, \$64,139,641 had been spent to construct 2,884 drainage systems in Minnesota consisting of 14,478 miles of open ditch and 9,451 miles of tile.
- The outstanding indebtedness of these systems was \$15,600,000 in the southern counties and \$7,500,000 in the northern counties.







## Resumption of Drainage with Conservation and Wetland Protection

- The drought that continued into the 1930's made drainage unnecessary and conservation became the most important water policy.
- By 1938, normal rainfall occurred and, from 1942 to 1945, the Minnesota Valley had the highest fouryear precipitation on record. The heavy precipitation and the demand for and realization of higher prices of agricultural products during and after World War II resulted in widespread renewed desire for drainage projects.
- Pressure increased to drain lowlands that were farmed during the drought but were too wet after normal rainfall returned.
- Long term neglect and the design of many earlier systems to drain blocks of land and not to accept
  additional water from other drainage systems caused the legislature to enact a drainage system repair
  and improvement procedure.
- Because drainage law covered many chapters of legislative enactments, a legislative interim commission was formed to make recommendations on the drainage law. The recommendation resulted in legislation that authorized only district courts and county boards to establish drainage systems and eliminated state and township drainage.



Follow these suggestions for good



#### MAKE COMPLETE PLANS BEFORE STARTING TO LAY TILE

Have a competent person, experienced in tile drainage design and construction, make the necessary surveys, plan the best and most economical system, stake out the tile lines and check construction. He will save you money and give you the best tile system for your soils. Plan your tile sys-

tem for all the wet area to be drained into one main even if you intend to tile only a part of the area at this time. Your main will then be large enough to handle all the area when it is tiled.

used to select the size of tile.

Be sure to have an accurate survey made of the field to be tiled. This is needed in order to plan the most efficient layout of laterals and mains. It will assure you that all low areas will drain. Accurate grade of the main must be determined because the size of the main depends upon its grade and the number of acros to be drained by the main. Insist that a standard tile drainage chart be Purchase only tile that meets the American Society of Testing Materials (ASTM) specifications. These specifications are your assurance of getting tile that is worth buying. Check the individual tile yourself. Reject those with deep cracks, large checks, lime spots, pebbles, and honey-

combed walls, as well as those that are out-of-round or warped. Good quality clay or concrete tile will give equal results under most conditions. If your soil is alkali or acid consult the Soil Conservation Service, county agent or drainage engineer before purchasing tile. Never allow tile to lie on wet ground for long periods of time during freezing weather. Completely back fill all trenches in which tile are laid before freezing weather begins. Do not accept concrete tile within 30 days of manufacture.

Be sure the tile is installed according to the survey and plan. You can be sure of this by engaging a competent contractor with good equipment and one that uses targets or string line in placing the tile on grade.



#### SIZE OF MAIN LINES BREATHERS OR VENTS Consult a standard tile drainage chart to determine should be considered at the bethe required size of tile. When no surface water is ginning of a steep section of . 4 INCH SEWER PIPE to be admitted to the tile select a tile size that will main and at approximately every remove 3% inch of water in 24 hours from the area CEMENTED JOINTS 1/4 mile on long mains. They imthat will drain into the tile system. Where open prove the operation of the syssurface inlets are used remove 3/4 inch in 24 hours. tem, mark the location of the tile line, and serve as inspection RELIEF WELLS . holes. Top of vent should be will reduce the pressure one foot above ground and cov-ered with wire mesh. and hazards of blowouts it used at the end of steep sections and below surface SEWER PIPE WITH inlets. Top of well should CEMENTED JOINTS STEEP GRADES ON MAIN LINES be about one foot above require special construction according to soil type and ground. conditions to insure continued operation. These are: Sandy - For grades over one per cent use sewer FLAT GRADES 1831 633 pipe with sealed joints. T- BRANCH Make grades as steep as Silt and Loam - For grades from 1/2 to 2 per cent possible on flat lands, but tamp clay firmly around tile. On grades over never less than 0.05 per 2 per cent use sewer pipe with sealed joints. cent for 4 to 12 inch tile. Clay-For grades from 1 to 6 per cent tamp clay firmly around tile. On grades over 6 per cent use sewer pipe with sealed joints. AVOID TREES PROVIDE SURFACE DRAINAGE SURFACE INLETS BLIND INLETS Consider blind inlets or Drain out ponded areas Use open surface inlets French Drains in small dewith shallow ditches where only as a last resort. They possible. This will give overload your tile line and pressions that cannot be you faster drainage .let silt and trash in. drained by waterways. GRAVEL, BATS OR CORNCOBS Tree roots will clog your tile. Remove all water-tolerant trees such as willow, elm and cottonwood within 75 feet of the tile line. It is good practice to keep all other trees NLET MUST BE WELL CONSTRUCTED & PROTECTED 50 feet or more from mains. When this is not possible use sewer pipe with cemented joints. However there is still danger of the tile fill-T LEAST 6 FT ing with roots. CONNECTIONS CHECKING BLINDING For quick, safe installation use manufactured "T" or "Y" branches. When these are not available the Place topsoil over tile immediately after laying. This lets water pass freely into the tile and holds the tile See that all flat grades, all changes in grade, and all turns are checked with a surveyor's junction tile should be chipped, fitted, and sealed with mortar. level. Do this after in place in case of rain and when the tile has been back filling. In sands or tight soils BRANCH laid and before you may need to the trench is blind tile with back filled. gravel, hay, straw JOINTS This is the or corn cobs. Drainage water time to enters the tile line catch misat the open joints betakes. tween the tile - not through the walls of the tile. The gap between tile POROUS TOP SOIL should be varied according to soil conditions: COVER TILE Sandy Soil ..... Tight fit 6 TO 12 INCHES Silt and Loam ..... About 1/6 inch LOCATION MAP Regardless of who installs your tile system insist that you re-County Road Property Fence 1950' - 5" tile ceive a map showing the location and size of all lines and the 365 depth and grade of the main. Such a map will save many times its cost by helping you locate breaks and stoppages. If you 1950 - 5" tile decide to add more lines you will know where to put them. 1950 5" tile It is a record of the capital investment you have added to the 1950 5" tile land. Put it away in a safe place. A good idea is to attach a copy to your deed 180'-5" tile MAINTENANCE 1200'-5" +ile Regular inspection of your tile system is essential. Prompt re-1200'-5" tile JOHN DOE FARM pair of any tile failures will keep the system in working order 1110'-5" tile N/2-Sec8-TSN-R-SW Blank Co. State and prevent permanent damage to the entire system. Use a Planed by: K H. Beach Contractor: Good Tile C May 1952 crop rotation with deep rooted legumes to insure the highest Ave. depth degree of drainage from your tile system over the years.



#### Post War/Cold War

- The post-war agricultural prosperity continued through the 1950's. Drainage projects were constructed, improved, and repaired in the agricultural areas that were formerly drained.
- Federal programs aided drainage financially and technically and extensive field drainage was accomplished by farm tile systems.
- About 15,000 miles of farm tile were installed from 1954 to 1956. About 85 percent of the tile was concrete and
- manufactured at one of 50 Minnesota tile plants.
- Almost 500 miles of open ditch were constructed or improved during the same period.
- 188,000 acres were drained in the Dakotas and Minnesota during 1949 and 1950 with federal assistance).
- Mechanized farming made wet areas an increased nuisance and small, irregular wet areas, if drained, represented income to farmers.



#### **Further Conservation Protections**

- The loss of "potholes," which was responsible for sixty-percent of the waterfowl reproduction, alarmed sportsmen and conservationists.
- In the late 1950's, a number of measures were taken to preserve wetlands, which also affected drainage. State offices and agencies were required to conserve rainfall where it fell, if practical.
- In the 1960's, land values began increasing, making drainage a desirable method of obtaining additional agricultural production land.
- In the late 1960's and early 1970's, conservationists began to question whether drainage was in the public
- interest.
- Judicial authority to establish drainage systems was eliminated and the legislature required the Commissioner of Natural Resources and drainage authorities to examine environmental and conservation criteria before establishing drainage projects.
- Public wetlands that were to be preserved were inventoried, and a state water bank program was created that authorized payments to prevent drainage of private wetlands.





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### Development of Legislation and Funding

- Interim commission formed to study conservation, drainage, and flood control (Act of April 22, 1953, ch. 643, 1953 Minn. Laws 785)
- State water resources board established (Act of April 25, 1955, ch. 664, 1955
- Minn. Laws 1002)
- Watershed districts authorized, which could assume drainage functions (Act of April 23, 1955, ch.
- 799, 1955 Minn. Laws 1232 )
- Drainage authorities were required to consider conservation of soil, water, forests, wild animals,
- and other natural resources when considering the public utility or benefit of a
- proposed drainage system (Act of April 22, 1955, ch. 681, 1955 Minn. Laws 1030 (d))
- Increased number of petitions for a new project from 50 to 60 percent (Act of April 24, 1957, ch. 638, 1957 Minn. Laws 860)
- U.S. DEP'T of Interior inventory of Minnesota wetlands stressing the need for conservation (Apr. 1955)









#### More Current Drainage Activities

- Almost all farm land that required drainage for agricultural purposes through large scale efforts has been drained or partially drained.
- The technology of on-farm drainage has improved, allowing surface and subsurface drainage to be constructed more efficiently.
- More farmers can install their own systems using plastic drain tile, trenching machinery, and technical services of the Soil Conservation Service and other public agencies.
- There has been a reversal of the policy of the federal and state governments from encouraging drainage projects through financial and technical assistance to the present policy of advocating wetland protection and preservation.
- Most of the new drainage will be confined to on-farm practices to improve existing crop land.
- Although the economic incentives to drain wet areas for agricultural production are not as great, farmers who need
  drainage to raise crops and who have paid for drainage rights are increasingly regulated by state and federal laws
  that attempt to preserve the public right to the benefits of wetlands.
- The regulations encroach on and, in some instances, prohibit drainage rights that have been part of farming for almost over a century.







- All drainage system costs are paid by the owners of property determined to be benefited by the drainage project or drainage system in proportion to the benefits, with two exceptions:
  - Since 2000, external sources of funding can be used in coordination with drainage system funds for the purposes of wetland preservation or restoration, creation of water quality improvements, or flood control.
  - Since 2019, repair costs alternatively can be apportioned based on relative runoff and relative sediment delivery from all property contributing runoff to the drainage system. (pilot expires in 2024)
- The relationship of drainage system management and conservation reflects an evolution, over 150 years, of legislative thinking about the public interest in the state's surface waters. This history reflects an evolving legislative judgment about where the boundary lies as between the private "right" to drainage and the public "right" to the natural condition of surface waters, and therefore about how the costs of conservation should be allocated as between landowners and the general public.







#### A Question to Ponder

 As precipitation trends change and private/reasonable use drainage continues, is maintenance of century-old systems sufficient to address both demand and conservation interests.





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