MINNESOTA

GOVERNMENT LAND OFFICE SURVEYS

THE REMONUMENTATION PROGRAM

Presented to the Legislative Reference Library 29 Nov. 1978, by the author

by Herbert W. Stoughton

Herbert W. Stoughton, P.E., L.S.
Geodetic Engineer

Assistant Professor
Department of Civil Engineering Technology
State University of New York
Agricultural and Technical College
Alfred, New York 14804

January 1978

TABLE OF CONTENTS

continued

FOREWARD

The Minnesota Land Surveyors Association (M.L.S.A.) has initiated a program to remonument the corners established in the original Government Land Office Surveys. For several years members of M.L.S.A. have conducted research and have published papers and maps pertaining to these surveys. Books, surveying manuals, surveying instructions, and other documents have been reprinted to assist surveyors in their work.

In 1977 M.L.S.A. worked closely with legislators to enact legislation to implement and to finance a remonumentation program. Although the legislation has not been enacted as of this date, M.L.S.A. has initiated an education program to inform the land surveyor of the remonumentation program.

Besides the Annual Meetings of M.L.S.A. where technical papers on the subject are presented, M.L.S.A. held a remonumentation workshop (January 13 and 14, 1978) to discuss procedures and techniques to remonument the Public Land Surveys in Minnesota. The material presented in this book forms the basis of the lecture presented at this workshop.

The writer would like to acknowledge the assistance furnished by Carlisle Madson of Hopkins and Harley R. Schneider of New Ulm for the information furnished on the Minnesota surveys. Special recognition is given to Mrs. Ruth Newell, who typed the manuscript, and to my wife, Catherine, who proof read the manuscript. Lastly, a special thanks must be give to my nine month old son, Sean, who refrained from disturbing the stacks of books, papers, and maps scattered throughout the house, although the temptation was great.

Herbert W. Stoughton, P.E., L.S.
Geodetic Engineer

28 January 1978
Almond, New York 14804

INTRODUCTION

The remonumentation of the Public Land Surveys of Minnesota occurs at a critical moment. The political, sociological, and environmental factors are no longer minor considerations in land tenure. Many surveyors have failed to remain abreast of the various possible uses of land boundaries. When our forefathers designed the public land system, they probably did not realize that the system could be the foundation for a cadastre that would meet the needs of sociologists, environmentalists, and statisticians.

While the land surveyor's primary function has been to retrace established boundaries and to subdivide lands, he has performed other functions. He is a direct link to the past. Being called upon to retrace boundaries requires the surveyor search historical and legal records to locate the property. The surveyor prepares maps for architecture and engineering projects, zoning changes, political subdivision annexations, special assessment districts (i.e. school districts, sewer districts, water districts, drainage districts, etc.), utility charter applications, tax mapping, flood plain mapping, highway accident mapping, and other projects too numerous to mention. The surveyor's work has been important for the economic and political growth of the community.

The public land survey boundaries traditionally have been associated with title boundaries, but in recent decades statisticians keeping records on land usage and population distribution have utilized the public land survey as a viable reference system. Although the sections have been subdivided and resubdivided, evidence of the original boundaries are evident in aerial photography, which the nonsurveyor can identify with little technical training. Imagery (photographic, short infrared, and long infrared) recorded from airplanes and satellites usually include many section lines. Therefore, it is a logical choice to perpetuate the public land surveys.

The coordinated effort to remonument the public land surveys and to extend the national geodetic horizontal control network will provide an excellent cadastre for tenures, resource inventories, sociological inventories, resource management and planning, tax mapping, and land use planning. To implement the cadastre will require the cooperation of all state surveying agencies, title companies, members of the State Bar Association, and land surveyors. If all parties do not cooperate to implement the program, the program may succeed, but it is highly

unlikely that it would be completed, and warrant the expense.

The remainder of this paper will review various aspects of the program.

THE LEGISLATION

The formal corner stone of this program is the proposed legislation authorizing the counties to remonument the public land surveys. Participants of the remonumentation program should carefully study the enacted bill. The legislation contains several sections which should be carefully scrutinized. A copy of the proposed legislation dated December 7, 1977, appears in Appendix E.

CONTRACTS

In Section 3 Subdivision 2 "the county board may enter into all necessary contracts...." Signing a contract between a governing agency and a professional person (or organization) is, in itself, not bad, but many persons associate a contract to perform professional services to mean that bids must be tendered, and (usually) the lowest bidder is awarded the contract. In New York State many counties have executed contracts for tax mapping to the lowest bidder. Poor enforcement of the contracts, and failure of some contractors to employ competent technicians have yielded poor results. Although Section 2 requires that licensed land surveyors perform this work, it should be noted that the *responsibility* of the Minnesota Board of Architecture, Engineering, Land Surveying, and Landscape Architecture must ensure that each licensee *meet minimum requirements* (Section 326.06 *Minnesota Statues Annotated* states that the Board "shall fix standards for determining the qualifications of applicants..."). I would like to recommend that the Minnesota Land Surveyors Association form a commission to study suitable selection processes for land surveyors to enter into contracts, to evaluate the quality of the work, and to arbitrate controversies arising between all parties (county board, contractor, county surveyor, private and public surveyors). Also, since the work of land surveyors has perpetual effect on titles, penalty clauses and the 'tenure of correction clauses' should last *ten or more years*.

COUNTY SURVEYOR'S DUTIES

The county surveyor is the logical 'on site supervisor' of the remonumentation of the government surveys. Since the territorial statutes, this officer has been enpowered to re-establish corners. Through the years the

county surveyor *should have collected* considerable records encompassing an extensive 'small area'. These records - although many of these records may contain dubious evidence - may contain:

1. Retracement surveys of original government surveys.
2. Updated physical ties and descriptions of original or remonumented government corners.
3. Highway surveys.
4. Subdivision of sections surveys.
5. Boundary surveys.

Also, the normal work performed by the county surveyor will give a good overview of the present status of the monumentation of the original surveys and location of problem areas in the county.

The first duty itemized in Section 4 of the proposed legislation raises two interesting questions.

First, in Section 389.03 the county surveyor's records are either maintained in the office of the county surveyor or the register of deeds. If stored in the latter location, the proposed legislation does not provide a mechanism to transfer the records or true copies of these records to the county surveyor. Some may consider this a minor problem. But, these records may be intermingled with other records, and their removal would be detrimental to public access. Also, if these records are voluminous and only copies are to be returned to the county surveyor, the logistics, integrity of the records, and quality of the reproduction are serious problems.

Second, Section 389.013 (1953) abolished the office of county surveyor in counties having populations between 300,000 to 450,000 inhabitants with all records delivered to the county highway engineer.

Items seven in the proposed legislation contains some good and some bad points. It states:

> (7) Collect and preserve information obtained from surveys to establish monuments or land boundaries. This information shall become a part of the public record and shall be duly recorded by the proper county officials;

This section contains some ethical and professional considerations. Before any surveys and remonumentation are executed, the county surveyor *must* obtain *all* available information from all sources to re-establish the "best" location for the corner. Many old survey records

have been collected by currently active land surveyors, and are considered their personal information. If the county surveyor acquires this information from private sources, then he *must place copies* of this source material into the public record. There are some land surveyors who will not permit access to 'private records' if these records are to be placed in the public records. Legislation or administrative guidelines should be formulated to eliminate this problem.

Item nine of the duties and responsibilities of the county surveyor undoubtedly will cause the most controversary. It reads:

> (9) Prescribe regulations designed to establish uniform professional surveying and mapping methods and minimum standards pursuant to the United States Department of Interior Manual of Instructions for the Survey of the Public Lands of the United States.

The standards for surveying in accordance to the aforementioned *Manual* will provide errors in closure considerably larger than one part in five thousand. If surveys are performed to determine the bearings and lengths, the data is *unacceptable* for extension of the state plane coordinate system. Since considerable expense will be expended to establish permanent monuments at all government corners (or witness corners for the true corner) and at least one government corner will be within one-half mile of all land within a section, it would seem appropriate that these monuments have been incorporated into the Minnesota State Plane Coordinate System. Section 505.23 stipulates that no state plane coordinates defining the position of a point on a land boundary can be used in any documents placed in public records unless the *point is within one-half mile of a triangulation or traverse station establish in conformity with standards adopted by the U.S. Coast and Geodetic Survey for first-order and second-order work.* If the horizontal control surveys executed to re-establish the government corners satisfy statutory requirements for establishing state plane coordinates, then the control survey data can be incorporated directly, with little or no additional surveying, into the control survey network that extends the state plane coordinate systems.

Another fact which must be considered in item nine is the enforcement of the prescribed regulations. It is a well known axiom that land surveyors are quite independent in performing professional work. Two surveyors performing the same measurement employing satisfactory equipment, procedures, and personnel will obtain slightly

different results. Although both answers are within specified tolerances of accuracy and precision, each surveyor will hold steadfastly to his own value, and ignore the other. A perfect example of this axiom appears at many center of sections. How many times have you retraced the boundaries of a section, re-establishing the quarter corners; proceeding to the center of section to find two, three or more 'monuments' in the vicinity? While none of these 'monuments' agree with your measurements, do you accept any of the old monuments? Or, do you set a monument where you think the center of section belongs?

Likewise, the English language is dynamic, and interpretations will produce acceptable minimum results. They undoubtedly will produce the variations which will reproduce the minor irritations that resulted from the original surveys.

While the proposed legislation empowers the county surveyor to prescribe minimum surveying standards, this officer is granted no power or authority to enforce the established standards. Since interpretation of the proposed standards undoubtedly will be challenged by contractors and other land surveyors, some means to arbitrate and to enforce decisions should be defined. Some persons might feel that the State Board for Architecture, Engineering, Land Surveying, and Landscape Architecture has the authority to handle these problems. The 1977 edition of the Minnesota State Agency Rules relating to the Board does not contain any rules that handle these problems. Also, with the duties and responsibilities of the Board as enumerated in Sections 214.01 to 214.12 and 326.02 to 326.15, the Board will have little time to expeditiously handle the numerous problems that arise.

Items one, three, five, six, and seven are closely interrelated. Although the county surveyors' domain varies from metropolitan-industrial to rural-agrarian to wilderness-recreation areas, the basic recording system and mapping *should be identical* in every county. The systems that will be implemented should be so designed that they can be filed and accessed by computers. The volume of data that the county surveyor will handle to complete this program is inestimable. It would be appropriate for all county surveyors to form a consortium to study the problems and design a fundamental system to be utilized by all county surveyors. Also, it must be emphasized that once the system is adopted and implemented *all county surveyors shall* employ the system. The system should be adopted as soon as the proposed legislation has been enacted.

Before the remonumenting of *any* corners takes place, the county surveyor should have a complete history of

the corner. While in theory this is ideal, it is recognized that it is impossible to obtain all the records. However, as stipulated in item one, the county surveyor *must contact* all surveyors who have records pertaining to a particular corner (whether these be acquired records from various sources or records of surveys performed by them) and catalog them in chronological order from the time of the original survey. If any discrepancies arise, which will undoubtedly occur, the county surveyor and/or a committee of experts should review the evidence and attempt to resolve the controversy. After the resolution of the controversy, a written report of the issues, and the solution will be placed in the 'history' of the corner in chronological order (i.e. date of resolution). Each corner should be a separate data entry by the commonly accepted names (i.e. N.E. cor. Sec. 1; N.E. cor. T1N R3E, S.W. cor. Sec. 30; S.E. cor. 36; etc.), state plane coordinates, geodetic positions, etc. Also, if an ambiguity arises from identifying a corner (i.e. double corners, closing corners, meander corners, etc.), then the file should contain a cross-reference to other corners in the vicinity of the corner (i.e. a radius of 200 feet). The files should be so arranged, that *all data* for a particular corner remain together, and that all new data for a corner are inserted in the file in chronological sequence behind existing data.

In the research for records the county surveyor should collect aerial photography of various epochs. An excellent source of photography is the U.S. Department of Agriculture. For several decades they periodically (about once every decade) have photographed the country. Other agencies (U.S. Geological Survey; U.S. Army Corps of Engineers; U.S. Forest Service; and various state, county, and municipal agencies) have photographed large areas for mapping. This photography may be quite useful to trace the history of changes in 'occupation lines' that have subsequently become obliterated. While in all likelihood the government corners will not appear in the imagery (old fences, tree or hedge rows, etc.) will appear.

Item six will be the most sought after document of the mapping program. The section maps will show all government corners and property lines of record. The map will be a reference to abstract and title companies, attorneys, surveyors, the general public, land planners, and tax assessors. It would be appropriate for these maps to be overlayed on an orthophoto map of the area. The orthophoto map would be compiled and transferred onto the reverse side of a mylar (chronoflex) sheet. On the top surface would appear all map drafting data. These maps could then be blueprinted for consumer use. The advantage this system has is twofold. First, since

all terrain features (streams, buildings, utilities, pavements, etc.) appear, the novice and inexperienced map reader will have little difficulty relating deed information to local features. Second, the maps remain in the county surveyor's office where they can be continually updated. It only requires a few minutes to reproduce the original.

A slightly more sophisticated variation of this system would be to prepare the orthophoto map on one sheet and the boundary information on a second sheet *at the same scale*. This system has the advantage of allowing the county surveyor to update the orthophoto map (rephotograph) to reflect the changes that have occurred. This latter system permits an expanded comprehensive data base of information required by various individuals and agencies. For example, separate maps could be prepared for:

1. Telephone, telegraph, electricity, and cable television transmission lines.
2. Sanitary sewers and septic field systems.
3. Flood plains and storm drainage systems.
4. Zoning and land use planning.
5. Gas lines, water lines and wells.
6. Soil and bedrock mapping.
7. Topography.
8. Transportation systems.
9. Special assessment districts (i.e. school, water, lighting, sanitary, drainage, etc.).

The scales of these maps will vary with the area. In rural areas a section or one-half of a section will cover a sheet, while in metropolitan areas as many as sixteen sheets might be required. County surveyors should agree upon map sizes and scales in order to retain some uniformity.

Item seven contains one of the most significant features of the program. While the legislation proposes to remonument and to perpetuate the government surveys, this item does not relate to the government surveys. The county surveyor *is obligated to collect and file information on all boundary surveys performed by private and government surveyors.* The most acceptable set of records would be maps of these surveys. Section 505.08 Subd. 1 stipulates map sizes - for plats - which could apply to all records of surveys. It would appear that this legislation would ammend Section 389.07.

If land surveyors do not file records of survey for all surveys performed, then the State Board of Architecture, Engineering, Land Surveying, and Landscape Architecture should prosecute the licensee under AE & LS 12.A.1 (Minnesota State Agency Rules, 1977 edition).

MONUMENTS

Various portions of the proposed legislation specifically discusses monuments. The Board of Architecture, Engineering, Land Surveying, and Landscape Architecture will be empowered to design the tablet for the monument. There are four basic corners that will be set (section corners - including closing corners, quarter corners, center of section, and meander corner). Tablets should be cast for each type of corner with an inscription. [See Figure 1 on the next page.]

If the tablets are to be encased in concrete posts, the posts should be at least forty-two inches long with rebar. When the monuments are placed, they should be set in wet concrete. This 'foot' helps to keep the monument stable during frost heave. All monuments should have two or more reference marks constructed of iron pipe at least four feet long filled with concrete and containing a stamped brass washer.

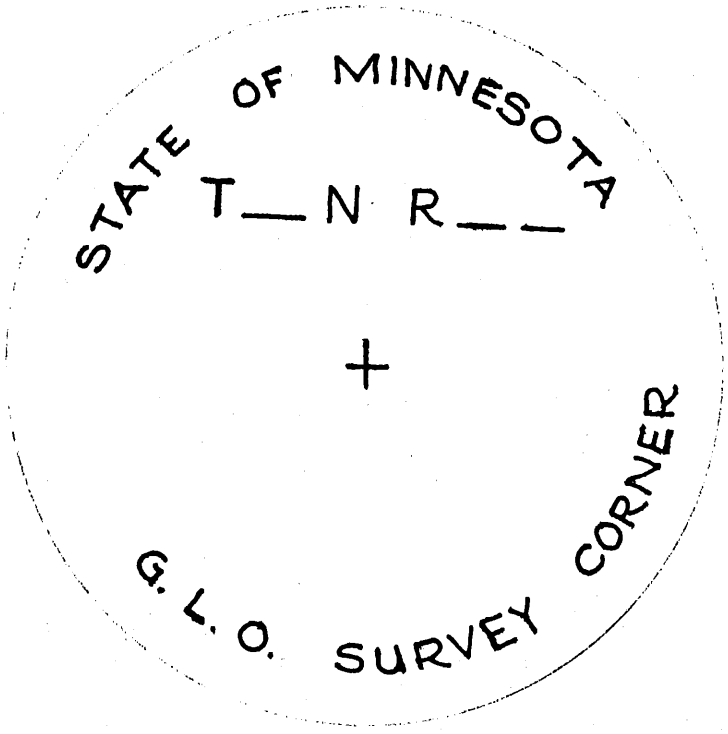
If these monuments are properly established, they will be satisfactory for horizontal and vertical control.

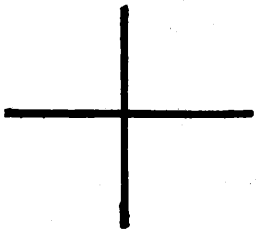
RESEARCH

The previous portion of this paper has reviewed technical aspects of the proposed legislation, which, this writer believes, merit careful scrutiny. The keystone to the success of the remonumentation program is not the legislation and surveys, but the research necessary to perform the surveys. Many surveyors fail to understand and to appreciate the significance research plays in retracement surveys.

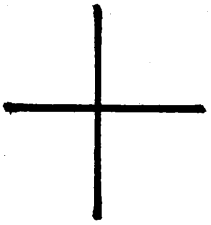
In *Definitions Of Terms Used In Geodetic And Other Surveys* by Hugh C. Mitchell land surveying is defined as:

> The determination of Boundaries and areas of tracts of land.
>
> *Land Boundaries* are usually defined by ownership, commencing with the earliest owners, and descending through successive ownerships and partitions. Land surveying includes the reestablishment of such new boundaries as may be required in the partition of land. The term "*cadastral survey*" is sometimes used to designate a land survey, but in this country (U.S.A.) its use should be restricted to the surveys of the *Public Lands of the United States*.

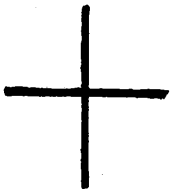




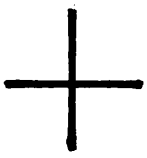
SECTION CORNER



1/4 SECTION CORNER



MEANDER CORNER



CENTER OF SECTION

Figure 1

The principal duty in land surveying *pertains to the location of real property boundaries.* The type of land surveying performed can be divided into two major categories - *retracement surveys* and *subdivision surveys* (not of sections).

The retracement survey requires the re-establishment of the original boundaries of a parcel of land. Today, most parcels of land to be retraced are not the entire parcel granted to the first owner (usually by letters patent), but a subdivision of the original grant (or even several generations of subdivision of the original grant). Depending on the deeds and the other legal documents, it may be necessary to retrace all or portions of the original grant.

The land surveyor's work as a retracement surveyor may be impeded by several conflicting 'rules'. An often quoted maxim of the retracement surveyor is: *"He (the surveyor) must follow in the footsteps of the original surveyor."* This statement is *well and good*, but we must remember that we no longer live in the nineteenth century, and that technology has not "stood still". Does the court mean by this maxim that the retracement surveyor must employ a circumferenter or a compass "of the Rittenhouse design" (that measured angles to a precision of about five degrees of arc) and a surveyor's chain made of knotted rope, bent iron links, or even wood? Or, does the court mean that the use of precise optical micrometer theodolites (that measure angles to one second of arc) and sophisticated electronic instruments (that measure distances to a few millimeters) are acceptable "tools of the trade" correlated with physical evidence, satisfactory to perform the retracement? If the latter system is acceptable, then the land surveyor *must have an intimate* understanding of the various instruments employed by generations of surveyors. The retracement surveyor must be able to read and interpret legal and historical records (in many instances only a small percentage of the original documents remain). The land surveyor *must* be able to re-establish *extinct monuments.* An extinct monument is one where all physical evidence of the original monument (the monument itself and the physical witnesses of the monuments, i.e. bearing trees, pits, mounds, etc.) and all living persons having personal knowledge of the location of the monument have passed away. Justice Cooley of the Michigan Supreme Court stated:

> It will probably be admitted that no man loses title to his land or any part thereof merely because the evidences become lost or uncertain. It may become more difficult for him to establish it as against an

> adverse claimant, but theoretically the right remains; and it remains as a potential fact so long as he can present better evidence than any other person. And it may often happen that, not withstanding the loss of all trace of a corner, there will still be evidence from which any surveyor will be able to determine with almost certainty where the original boundary was between the subdivision.

Illegibility, spelling idiosyncrasies, and transcription errors in various records further complicate interpretation of the documents.

Another important maxim the land surveyor must follow is: "He (the surveyor) is not to assume that a monument is lost until after he has thoroughly sifted the evidence and found himself unable to trace it." Justice Cooley continues: "It is known that surveyors sometimes, in supposed obedience to the State statute, disregard all evidences of occupation and claim of title, and plunge neighborhoods into quarrels and litigation by assuming to "establish" corners at points with which the previous occupation cannot harmonize." Some currently licensed land surveyors do not adhere to this policy, and state on their survey maps: "This map is a survey based on a deed furnished by the client." This deed furnished by the client may contain serious defects in the legal description, which became apparent when the records are reviewed.

Justice Cooley concludes:

> It is merely idle for any State statute to direct a surveyor to locate or "establish" a corner, as the place of the original monument, according to some inflexible rule. The surveyor on the other hand must inquire into all the facts; giving due prominence to the acts of the parties concerned, and always keeping in mind, *first* that neither his opinion nor his survey can be conclusive upon parties concerned; *second*, that courts and juries may be required to follow after the surveyor over the same ground, and that it is exceedingly desirable that he govern his action by the same rights and rules that will govern theirs. ... Surveyors are not and cannot be judicial officers, but in a great many cases they act in a *quasi* judicial capacity with the acquiescence of parties concerned; and it is important for them to know by what rules they are to be guided in the discharge of their judicial functions.

The land surveyor not only must be able to read and interpret the records, but he must have adequate knowledge of the law, statutes, and pertinent court decisions.

For the retracement of a few sections much of the information the land surveyor requires is generally available locally (i.e. county surveyor's office, other local surveyors, register of deeds, etc.). However, few surveyors have taken the time to study and comprehend the activities of *all personnel* involved in the original surveys. Most surveyors *fail to understand* the duties, responsibilities, and functions required to retrace old surveys. As time passes the persons involved pass from the scene, and successive generations of surveyors learn fewer details of the surveys. Reviewing original field notes and plats gives surveyors the unalterated facts of lengths, bearings, and areas, but does not usually inform us *why* the surveyor performed his duties in a particular sequence.

When the original instructions were published in 1879 to retrace the public land surveys [see Appendix C], most of the public land surveys were less than sixty years old. In most instances much of the original corner monuments or evidence of the original corners remained in every township, and surveyors were re-establishing one or two corners where simple rules were applicable. Today, while the rules of remonumentation of lost and obliterated corners are identical to rules printed in 1879 and the first circular in 1883, the problem becomes more complicated when fifty percent or more of the interior corners of a township are obliterated.

If we study the plats of the public land surveys performed in the territories east of the Mississippi and those states along the west bank of the Mississippi River, we shall observe similarities and differences. Readers of modern surveying textbooks with a single chapter on the public land surveys will note the differences but not understand the reasons for the differences. If we view plats of townships in an area, we shall find similarities and differences.

For example; in Michigan all the townships for the southern half of the lower peninsula appear quite similar; the upper half of the lower peninsula are similar to each other, but slightly different than the lower half of the peninsula. In the upper peninsula most of the plats (except for two small areas) are quite similar to each other but quite different from all the plats in the lower peninsula. If we study the plats by dates we find a large variation in the drafting with some plats containing very ornate pictographs of Indian villages, cultivated fields, bogs, swamps, falls, springs, trails, etc., in the plats prepared before 1820. After that date, the plats are quite similar in drafting and information portrayed. Also, how does a plat similar to Figure 2

(next page) evolve? If we plot several tiers of townships east of the Michigan Meridian in the lower peninsula we observe that the east-west width of townships near the meridian are narrower than townships in the same tier further east. Also, correction lines are spaced at sixty mile intervals on the west side of the meridian while on the east side of the meridian the first correction line is one-hundred twenty miles north of the base line (equivalent to the second correction line on the west side of the meridian), then spaced at sixty mile intervals.

What were the reasons for these significant departures from the form presented in textbooks? Very few Michigan surveyors could answer these questions two decades ago. For over ten years Ralph Moore Berry, P.E., L.S. (Emeritus Professor of Geodetic Engineering, University of Michigan) studied the public land surveys of Michigan. His work showed that at least *four* general sets of general instructions were employed in Michigan. He located and reproduced the special instructions employed for the survey of about four hundred townships, which no surveyors had seen.

The research Professor Berry performed and the work of Professors J.S. Dodds and L.O. Stewart (Iowa) have benefited surveyors, title companies, and attorneys. Few people realize the amount of work these gentlemen and their subordinates performed collecting, sorting, evaluating, and publishing the information.

The information surveyors and title companies require to understand the development of the public land surveys and the origin of titles *will not be found* in a single location. Appendix A lists references of published material which the author deems appropriate for understanding the subject. Although Appendix A contains published material, this information pertains to a general understanding of the subject, and the *specific information* for the public land surveys of Minnesota is located in various archives.

All original surveys in Minnesota were performed under contract. A surveyor general was appointed to supervise the surveys for a District or Territory. The surveyor general maintained an office in the territorial capital or a 'metropolitan' area near the site of the surveys. He initiated contracts with deputy surveyors to perform surveys, reviewed completed surveys, and transmitted the completed surveys to the Commissioner of the General Land Office in Washington, D.C. Until about 1850 each surveyor general was completely independent to interpret and administer the statutes and the guidelines from the Commissioner.

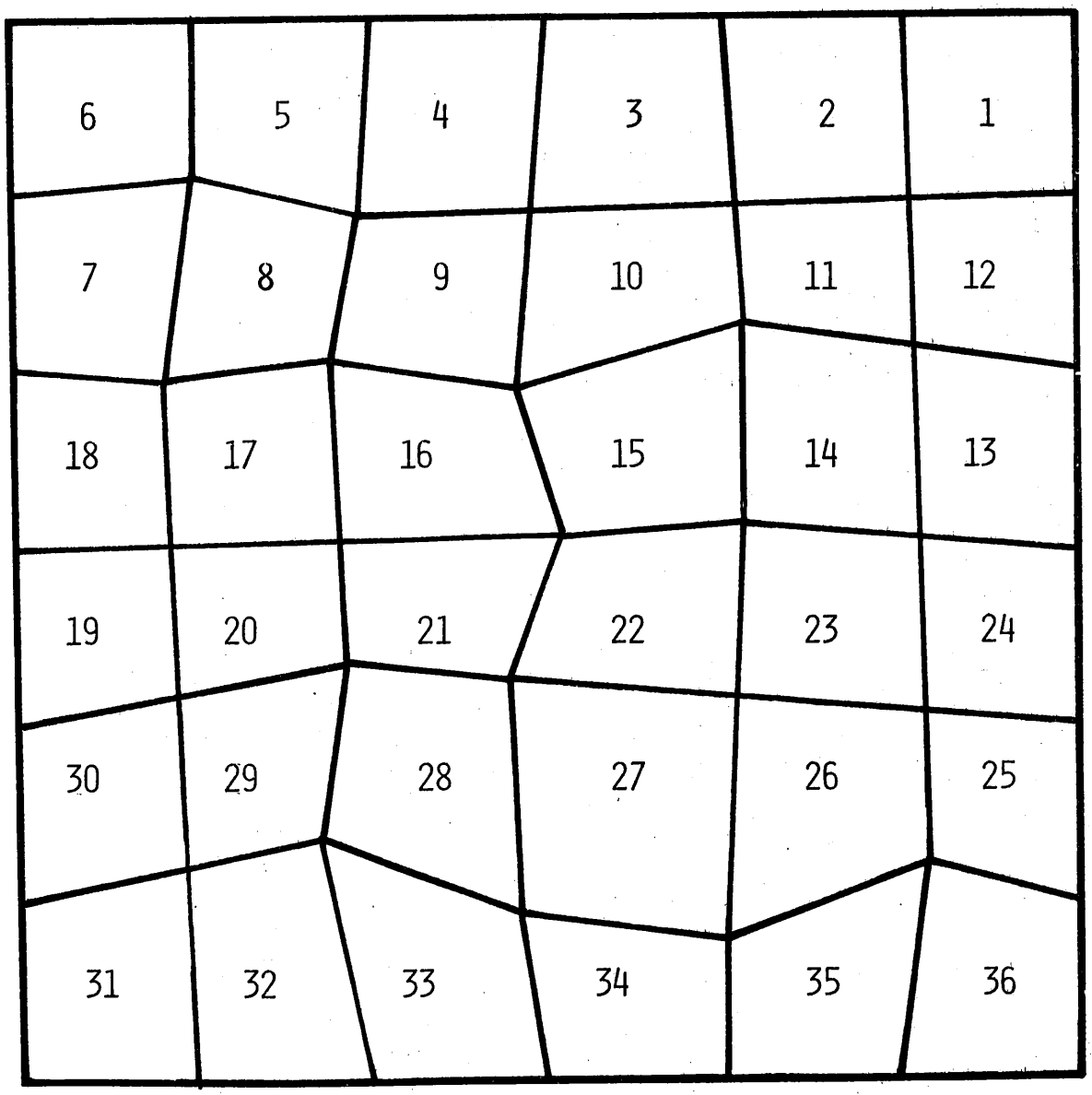

6
5
4
3
2
1
7
8
9
10
11
12
18
17
16
15
14
13
19
20
21
22
23
24
30
29
28
27
26
25
31
32
33
34
35
36

Figure 2

The surveyor general usually would prepare a set of general instructions, which he issued to each deputy surveyor at the time a contract was signed. These general instructions usually are identified as "General Instructions for Surveys of the General Land Office for the _____ Territory, *date*". Only one set of these instructions is not identified in this manner. The general instructions prepared in 1815 for surveys of lands north of the Ohio River (also known as the Northwest Territory) are known as Tiffin's Instructions, for Edward Tiffin who was surveyor general. Most of the general instructions subsequently prepared resemble the format set down by Tiffin. Appendix B lists the known general instructions prepared by various surveyor generals.

At the conclusion of the Mexican War (1848) the Commissioner of the General Land Office apparently recognized that these general instructions varied slightly from jurisdiction to jurisdiction and were based on each surveyor general's interpretation of the statutes. Therefore, in 1851 the Commissioner ordered published a set of instructions with maps and sample field notes for use in the newly established surveying district known as the Oregon Territory (Oregon and Washington). Research indicates that the first printing (1851) of these instructions did not include the maps and diagrams mentioned in the text. Shortly after 1851 the Commissioner issued instructions to other surveyor generals to issue the Oregon Instructions with all new contracts. Therefore, surveys executed under the 1851 Oregon Instructions are found in California, New Mexico, Kansas, Nebraska, and Minnesota.

In 1855 the Commissioner of the General Land Office published a new set of general instructions. These instructions contain several important changes in the Oregon Instructions, but the format and style were retained. The sample field notes were identical except for a few minor changes to reflect changes in the instructions. Since 1855, the General Land Office and its successor - the Bureau of Land Management - have published general instructions. A list of these publications is included in Appendix B.

By 1850 surveyor generals and the Commissioner were receiving numerous inquiries into the restoration of lost corners. By 1879 these inquiries were so frequent and so similar, that the Commissioner printed instructions to re-establish lost corners [see Appendix C for a copy of the text]. In 1883 the General Land Office issued the first of a series of circulars for re-establishing lost corners. Appendix B lists the various dates of publication of these circulars. Recently, all these circulars were reprinted in a single volume.

Besides the instructions published by surveyor generals and the General Land Office, special instructions were issued. These instructions varied from minor changes in the general instructions to instructions for surveying islands, meandering bodies of water, etc. These special instructions may not be apparent when reviewing the original field notes and the plat. To locate special instructions requires additional research.

After about 1820 the work performed in the Offices of the Surveyor General was fairly well standardized. A contract would be issued; the deputy surveyor would take his oath of office; post a performance bond; and depart to the project site. The deputy surveyor would perform his surveys, and in the field notes would appear the oaths of office of the deputy surveyor's assistants and the survey data in the form specified in the instructions. If the deputy surveyor encountered any unforeseen problems in the field, he would write the surveyor general for instructions. The surveyor general then would issue special instructions in the form of a letter. Usually, *two copies* of these special instructions exist - one copy for the deputy surveyor and one copy for the files. In some instances a third copy of these special instructions was prepared and transmitted to the Commissioner. Besides the normal accounting books for expenditures and salaries, the records of a particular surveyor general were identified as:

1. Correspondence to the surveyor general.
2. Correspondence to the Commissioner.
3. Correspondence from the surveyor general.
4. Correspondence from the Commissioner.
5. Contracts and Bonds.

When the deputy surveyor returned his field notes, a second copy of the notes were prepared (either by a clerk in the surveyor general's office or by the deputy surveyor). Then, at least two plats of the township were drawn. After review, the 'copy' of the field notes and one copy of the plat would be submitted to the Commissioner. Additional plats may have been prepared for distribution to land offices. When the state authorized receipt of the survey records, the surveyor general turned over the original field notes (compiled by the deputy surveyors) and one copy of the plat.

In Minnesota there exist two additional sets of field notes that are important. In parts of the state the original of the field notes (actually recorded in the field) from which the "original field notes" on file in Minnesota and Washington have been preserved. These are called "the running notes" and *must* be considered the original notes of the deputy surveyor. These field notes are found in Washington.

When reviewing the original plat and the 'original field notes' significant differences between lengths recorded on the plat compared with the field notes may occur. It is not necessarily a transcription error, but changes made by a General Land Office *examiner.* Research indicates that an examiner would randomly select townships to check. This examiner actually re-surveyed all or portions of a township. If his measurements disagreed radically from the deputy surveyor's work he *would change the original plat* but not the field notes. Also, the examiner would destroy the erroneous corner and physical ties. These field notes are called *Examiners Notes* and are in Washington. It is quite probable that only a few townships were examined. There does not appear to be any pattern to the selection of townships that were examined.

Also, when the surveyor general moved the office, he would sometimes turn over his files listed above to the state. These files, which are very important, are scattered. It requires persistent investigation to locate these records. In some instances copies of all or portions of these documents are in the National Archives (Washington, D.C.), and have been microfilmed - but not indexed. All the information available - when found - is in script, which is difficult to read. Since surveys in Minnesota commenced in the 1840's and continued into the twentieth century, it is likely that the records are very extensive. Inspection of the state map depicting the townships (2,520 ± 4 townships in the state) would indicate that special or supplemental instructions were issued to deputy surveyors. The importance of these special instructions cannot be estimated in comprehending the procedures employed in the surveys.

Another source of information which may be helpful is the special congressional acts, which pertain to the Minnesota public lands. Railroad grants, public improvement grants, school and college land grants, swamp land grants, etc. sometimes affected surveys and titles. [A partial list of these acts appears in Appendix D.] For the title companies, the Indian treaties for acquisition of lands by the Federal Government are important. These treaties have been transcribed and reprinted in various sources. Many attorneys and title companies believe the chain of title commences with the issue of letters patent from the General Land Office. However, in recent years several court cases have been decided in favor of the Indians and against the state and/or present owners [New York (2) and Maine are examples].

The final portion of the research pertains to the individual corners. *Before any corner is monumented, the*

county surveyor must have a complete documentary history from the time of the original survey. This information normally will be found in surveyors' field notes. Every attempt should be made to verify when a corner was re-monumented, the reason for the remonumentation, and verification of acceptance by everyone. This information is compiled by the county surveyor.

If a corner is lost, the county surveyor *must* research deed information as well as old surveyor's records. Every attempt should be made in physically searching the area of the lost corner. Many times the original monument is buried under debris or fill (in roads) or is in sight only a few tens of feet from the assumed location. Several times surveyors have taken a shovel or a backhoe to locate a supposedly lost corner. This rule has been violated countless times, and has embarrassed many surveyors. In one instance a surveyor re-established a section corner for a boundary that controlled a new residential subdivision of several hundred lots. A few years later the county surveyor was working in the area, and recovered the original monument (scribed stone) without any excavation nearly one hundred feet from the re-established corner. There was no reason for this type of oversight.

The county surveyor and the retracement surveyor *must understand* that the remonumentation of individual townships as a single entity is impractical. How do we know which monument found in the field is which corner, when double or even triple corners were established within a few links of each other? The townships are interrelated (physically), and cannot be separated as individual entities. A perfect example of the need to research and to correlate survey information appears in the township boundary surveys in a mid-western state. The deputy surveyor was running the east line of T33N, R6E (not the real number), and after setting the E 1/4 corner of Section 1 he proceeds north 40 chains and "sets a *temporary point* at the NE corner of Section 1". Then, he proceeds west to set the N 1/4 corner of Section 1, and continues westerly along the northerly boundary of the township. The data for the township boundary is plotted on the plat. In the notes for T34N, R7E [the southwest corner of this township is the northeast corner of the previous township] the *same deputy surveyor* is surveying westerly along the southerly boundary of the township. At the S 1/4 corner of Section 31 he writes "thence westerly 40 chains to east line of T33N, R6E; *set true corner 1.50 chains southerly of temporary point*." Several surveyors had assumed that the corner in the field was the temporary corner (for T33N, R6E), and had used the measured data to re-establish the corners on the township boundary. This has upset the restoration of lost interior corners for T33N, R6E, and

caused considerable confusion. One surveyor reset the temporary point, and then proceeded to re-establish other corners. This surveyor found close agreement with the physiographic calls in the original field notes. No information on the plat for T33N, R6E indicates a shortening of 1.50 chains for the east boundary of the northeast quarter of Section 1. [See Figure 3 on next page.]

Every precaution should be observed to ensure that every monument set is at the most probable location of the original monument, and that it causes the least harm to title boundaries in the area. Additional information on research and resurveys is found in *Minnesota Land Surveyors Association Surveys Manual* (Chapter 3).

STATE PLANE COORDINATES

The State of Minnesota has enacted a state plane coordinate system based on the Lambert Conformal Secant Conic Projection. The system was designed in the 1930's by the U.S. Coast and Geodetic Survey (now known as the National Geodetic Survey). The conformal map projection is a mathematical model which relates angles and elemental lengths on two surfaces. The definition of conformal projection means that the angle represented on both surfaces are equal, and a single ratio (called a scale factor) relates elemental lengths on both surfaces for a single point - no matter what the azimuth is of the elemental length. Details on use of state plane coordinates are well documented in the surveying literature, and will not be discussed here.

However, there are several points concerning state plane coordinates that will be reviewed. The importance of state plane coordinates cannot be overemphasized. Every point that has state plane coordinates *is referenced by every other horizontal control station computed on the North Datum of 1927*. This means that if all evidence of any point is lost, the point can be replaced within the limits of errors of measurement from *any two* horizontal control points on the North American Datum of 1927. It is highly unlikely, but a surveyor could employ two survey stations separated by hundreds (or even thousands) of miles and both be hundreds of miles from the point to be reset. Granted, it would require some sophisticated surveying technology to re-establish the point, but it is practical to accomplish.

Reviewing the enacted legislation the reader will discover some portions which must be updated or revised. In Sections 505.18, 505.20 and 505.22 for the name *United States Coast and Geodetic Survey*, change to read *National*

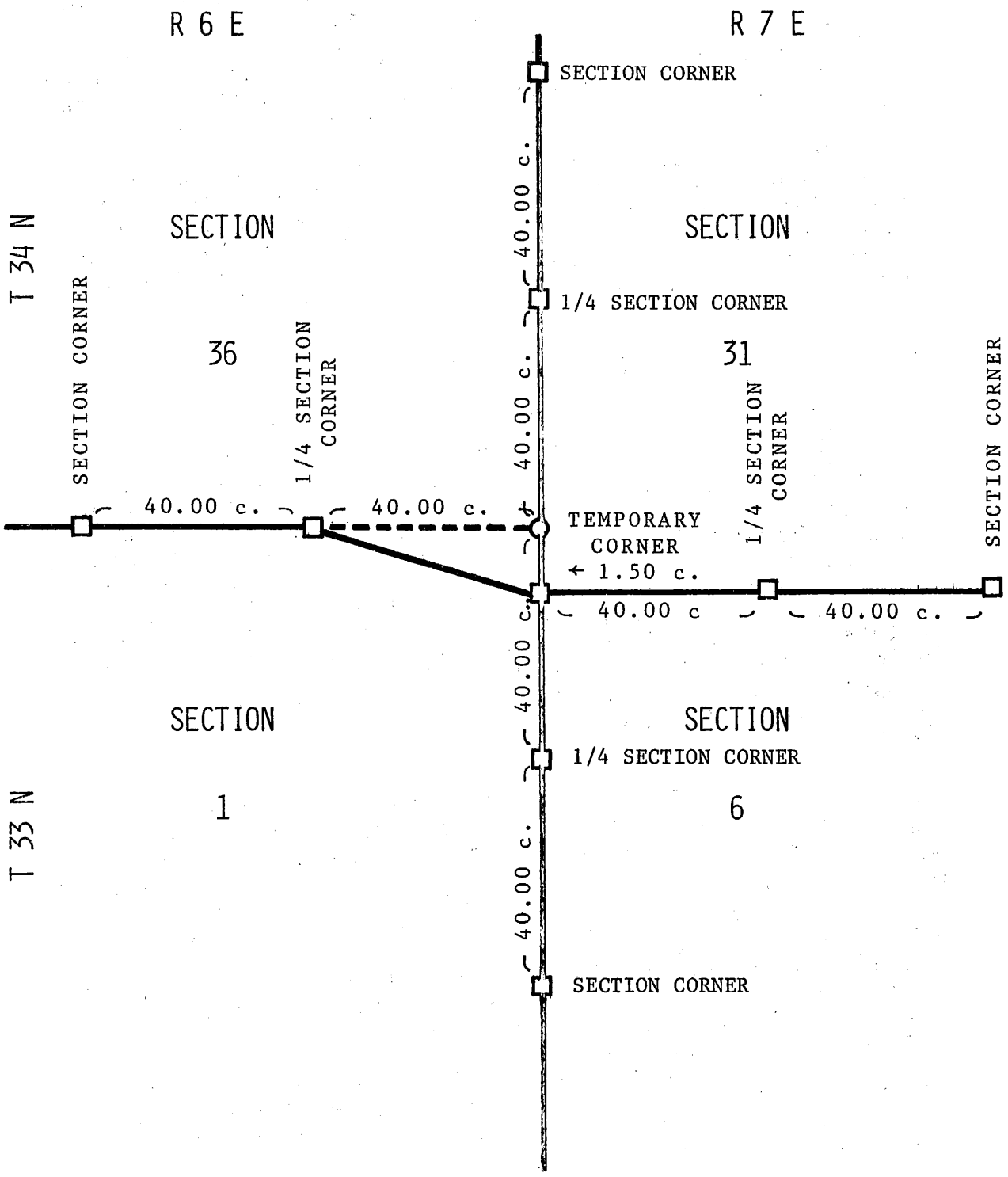

R 6 E
R 7 E
T 34 N
T 33 N
SECTION
36
SECTION
31
SECTION
1
SECTION
6
SECTION CORNER
1/4 SECTION CORNER
1/4 SECTION CORNER
SECTION CORNER
1/4 SECTION CORNER
SECTION CORNER
TEMPORARY CORNER
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
40.00 c.
1.50 c.

Figure 3

Geodetic Survey, National Oceanic and Atmospheric Administration, Department of Commerce (or its successor). In Section 505.20 the units of length should be in *meters* not *feet.* Since the United States is committed to the metric system, it is only logical to make this change.

In Section 505.23 the type of horizontal control is too restrictive. With the advent of electronic distance measuring equipment (E.D.M.) it is possible to extend horizontal control inexpensively, but with a high degree of accuracy and precision by trilateration. Therefore, this section should be changed to read *triangulation, traverse, trilateration, or other methods* (i.e. satellites, photogrammetry, stellar interterometry, etc.) *proven acceptable by the National Geodetic Survey, or its legal successor.*

In Section 505.22 (b) the statement of the standards of accuracy should be changed. Some people interpret this section to mean the standards of accuracy *in effect at the time the legislation was enacted.* The legislation should read: "for First-Order and Second-Order work in accordance to *Classification, Standards of Accuracy and General Specifications of Geodetic Control Surveys* (prepared by the Federal Geodetic Control Committee, National Oceanic and Atmospheric Administration) dated February 1974, and all subsequent revisions that are published at the time the control surveys are executed."

The last revision to the legislation will probably be the most controversial. For some years the National Geodetic Survey has encountered problems incorporating new horizontal control surveys into the network known as the North American Datum of 1927 as computed on the Clarke Ellipsoid of 1866. In the 1920's when it was decided to retain the Clarke Ellipsoid of 1866 as the reference spheroid the amount of horizontal control was relatively small. Since 1927, the volume of data has increased tremendously. The application of electronic distance measuring equipment, Doppler positioning systems, and artificial satellites have strengthened these control surveys by adding long distance and azimuth checks, which were not feasible a few decades ago. Therefore, in 1983 the National Geodetic Survey plans to complete the transfer of the horizontal control net from the North American Datum of 1927 to the North American Datum of 1983. Also, they will adopt a new reference ellipsoid. At this time (January 1978) these parameters have not been published, but should be in the next few years.

The shift between the two datums is not a simple translation-rotation process. The translation of data will require recomputation and adjustment of observations

(angles and distances) on the new datum. Since a relatively small amount of surveying has been performed employing the present state plane coordinate system, it will require only archival retrieval and use of a digital computers to perform the conversion. Therefore, the legislation should be ammended (Section 505.22) by deleting all mention of the "North American Datum of 1927" and the "Clarke Ellipsoid of 1866". The act should read (where appropriate) "the North American Datum of 1983 as defined by the National Geodetic Survey."

The Lambert Conformal Secant Conic Projection with three zones should be retained. The shifts between the 1927 and the 1983 datums should be so small as to negate any changes in the latitudes and longitudes defined in Section 505.22. Also, the x-coordinate of the origin should be 2,000,000.000 meters.

Finally the surveying and mapping community should employ the "exact formulas" with *twelve* significant figure computers to implement these projections. The formulae are found in numerous publications including the *Theory Of The Michigan Coordinate System* by Ralph Moore Berry (circa 1965).

In Section 505.22 (b) it states: "whose geodetic positions have been rigidly adjusted..." With present technology this means that least squares adjustments are the only viable method to employ. Crandall's Rule and Bowditch's Rule (Compass Rule) assume certain conditions which are sometimes invalid. Therefore, the use of these adjustment procedures should be discontinued.

Lastly, with sophisticated hand held programmable calculators, the practice of converting field observations for control surveys to grid lengths and grid angles should be eliminated. As lines are lengthened the correction terms for scale factors and azimuths are no longer a single number, but a series of small corrections to this number that must be applied. Therefore, all control surveys should be computed and adjusted in geodetic positions. This requires that only the length be reduced to sea level. After the adjusted geodetic positions are available, it is a simple task to convert to plane coordinates.

RECOMMENDATIONS

The previous portion of this paper has discussed problems and merits of the program. There are several recommendations, which if incorporated, would enhance the remonumentation program.

Since the remonumentation program encompasses the entire state, there should be a *state surveyor* or *surveyor general*. This person's responsibility would be to oversee the remonumentation program. He and his staff would search, reduce, and evaluate the historical records of the Surveyor Generals and the General Land Office. The research role of this officer would be similar to the work performed by Professors John S. Dodds and Lowell O. Stewart and published in the two books listed in Appendix A.

The surveyor general should be recognized as an acknowledged expert in *all phases* of surveying and mapping. He would act as a consultant to the county surveyors and assist them in evaluating evidence and resolving (if possible) the conflicts. Also, the officer should assist in preparation of contracts and be the arbiter (with the assistance of legal counsel) of any conflicts that arise between the contractor and the County Board and county surveyor.

The final duty of the surveyor general is to supervise and evaluate all control surveys executed by various agencies to extend the state plane coordinate system. Also, the surveyor general would be the official liaison with Federal surveying and mapping agencies. This duty would reduce duplication of the endeavors of over eighty-five county surveyors. Other responsibilities should include preparation of the contracts for remonumentation, photogrammetric mapping, and control surveys, which will ensure uniformity throughout the state. The office of Surveyor General *should be independent* of all state mapping agencies to ensure that no question of conflict of interest arises.

The second recommendation is that all future surveys be metric. The reason was discussed earlier.

The third recommendation is that the surveys be so designed in order that the fundamental data established be the basis of a state cadastre.

The fourth recommendation is to revise the state plane coordinate law to rectify implied obsolescence and incorporate new technology. The details of these proposed revisions were discussed earlier.

The fifth recommendation is to introduce legislation or promulgate administrative rules that give the county surveyor the necessary authority to enforce specifications and arbitrate controversies.

The sixth recommendation is that the Minnesota Land Surveyors Association prepare a manual of practice. Although M.L.S.A. has initiated this work, one section that has not been compiled and published pertains to statutes and court decisions which are directly applicable to the surveyor. The statutes are not found in a single chapter of such books as *Minnesota Code Annotated*, but are found throughout the entire set of volumes. These laws pertain to various county offices and officers, real property, criminal law, corporations, state agencies, etc.

CONCLUSION

The remonumentation program of the public land surveys of Minnesota comes at a crucial time in professional practice. The system should be developed to be the foundation of tenure and other cadastre programs which will be initiated in the future.

The program requires close cooperation of all surveyors and mapping agencies. Everyone must suppress their reservations and anomosities to others, and work together to produce the best product for the benefit of the nonprofessional - for the fundamental reason of licensure is to *protect the public*.

APPENDIX A

REFERENCES

General Background

1. Brown, Curtis M. and Eldridge, Winfield H. *Evidence And Procedures For Boundary Location* [New York: John Wiley & Sons; 1962].

2. Brown, Curtis M. *Boundary Control And Legal Principles* [New York: John Wiley & Sons; 1957].

3. Brown, Curtis M.; Landgraf, H. Frederick; and Uzes, Francois D. *Boundary Control And Legal Principles* (second edition) [New York: John Wiley & Sons; 1969].

4. Carstensen, Vernon (editor) *The Public Lands: Studies In The History Of The Public Domain* [Madison: University of Wisconsin Press; 1962].

5. Cazier, Lola *Surveys And Surveyors Of The Public Domain, 1785-1975* [Washington: Government Printing Office; 1976].

6. Gates, Paul *History Of Public Land Law Development* [Washington: Government Printing Office; 1968].

7. Hibbard, Benjamin Horace *A History Of The Public Land Policies* [Madison: University of Wisconsin Press; 1966] (reprint of the 1924 edition).

8. Pattison, William D. *Beginnings Of The American Rectangular Land Survey System, 1784-1800* [Chicago: University of Chicago Press; 1957-1964] (reprinted by the Ohio Historical Society; Columbus, Ohio, 1970).

STATE OF THE ART

9. Bellows, Charles F. and Hodgman, Francis *A Manual Of Land Surveying* [Ann Arbor, Michigan:

Register Printing; 1886]. (Several editions were printed from 1888 to 1913 with Hodgman the sole author of these editions.)

10. Clark, Frank Emerson *A Treatise On The Law Of Surveying And Boundaries* [Indianapolis: Bobbs-Merrill; 1922].

11. Clark, Frank Emerson *A Treatise On The Law of Surveing And Boundaries* (second edition) [Indianapolis: Bobbs-Merrill; 1939].

12. Clark, Frank Emerson and Grimes, John S. *A Treatise On The Law Of Surveying And Boundaries* (third edition) [Indianapolis: Bobbs-Merrill; 1959].

13. Clark, Frank Emerson and Grimes, John S. *A Treatise On The Law Of Surveying And Boundaries* (fourth edition) [Indianapolis: Bobbs-Merrill; 1976].

14. Dodds, John Simpson; McKean, J.P.; Stewart, Lowell O.; and Tigges, G.F. *Original Instructions Governing Public Land Surveys Of Iowa - A Guide To Their Use In Resurveys Of Public Lands* [Ames, Iowa: Iowa Engineering Society; 1943].

15. Hawes, J.H. *Manual Of United States Surveying, System Of Rectangular Surveying* [Philadelphia: J.B. Lippincott; 1868] (reprinted in 1882).

16. Stewart, Lowell O. *Public Land Surveys - History, Instructions, Methods* [Ames, Iowa: Collegiate Press; 1935].

17. —— *Digest Of Public Land Laws* [Washington: Government Printing Office; 1968].

18. —— *United States Code Annotated, Title 43; Public Lands* (2 volumes) [St. Paul, Minnesota: West Publishing Co.].

19. —— *Restoration Of Lost Or Obliterated Corners And Subdivision Of Sections, 1883-1974* [Sacramento, California: Carben Surveying Reprints; 1977].

LAND DATA SYSTEMS

(Chronological Order)

20. —— *Proceedings Of The Symposium On Land Registration*

And Data Banks, November 13 to 15, 1968 [Ottawa: Canadian Institute of Surveying; 1969]. (Also printed in *The Canadian Surveyor*; volume XXIII Nos. 1 and 2.)

21. Fisher, Kenneth Paul and Moyer, D. David *Land Parcel Identifiers For Information Systems* [Chicago: American Bar Foundation; 1973].

22. —— *Proceedings Of The North American Conference On Modernization Of Land Data Systems [A Multi-Purpose Approach]* [Washington: American Congress On Surveying And Mapping; 1975].

Notes:

1. Items 9, 14, 15, and 16 have been reprinted, and are quite inexpensive.

2. Items 10 and 11 would be preferred, because Frank Emerson Clark was a member of the Minnesota Bar and practiced in Minnesota.

3. Items 12 and 13 were written by John S. Grimes, and contain a larger percentage of material that does not pertain to Minnesota. This does not mean that the works are not valuable references.

APPENDIX B

PUBLIC LAND SURVEYS

INSTRUCTIONS ISSUED BY VARIOUS SURVEYOR GENERALS

Date	Title
1811	Instructions to Deputy Surveyors surveying lands adjacent to navigable streams, lakes, bayous, etc. in the Orleans Territory (Louisiana).
1815	Instructions for Deputy Surveyors by Edward Tiffin, Surveyor General, Northwest Territory (known as Tiffin's Instructions).
1831	Circular from the General Land Office, Washington, D.C.; dated 23 September 1831.
1831	Specimen of field notes - Mississippi.
1832	Instructions For Surveying In The State Of Mississippi (by Gideon Fitz).
1833	Instructions To Deputy Surveyors, Territory of Arkansas.
1833	Instructions To Deputy Surveyors, States of Ohio and Indiana and Territory of Michigan [Note: There are two versions of this manual. The original version follows Tiffin's Instructions. Shortly after issue, *all* printed copies were hand corrected. In correspondence to deputy surveyors who were awarded contracts, these changes were called to the attention of the deputy surveyor.]
1834	General Instructions To Deputy Surveyors In Illinois And Missouri.
1837	General Instructions To Deputy Surveyors (Arkansas).
1842	General Instructions To Deputy Surveyors (Florida).
1843	General Instructions To Deputy Surveyors (Arkansas).
1846	General Instructions To Deputy Surveyors (Wisconsin and Iowa).

1850 General Instructions To His Deputies (Ohio, Indiana, and Michigan).

1850 General Instructions To Deputy Surveyors (Florida).

1851 General Instructions To Deputy Surveyors (Wisconsin and Iowa).

1851 Instructions To Surveyor General of Oregon, A Manual Of Field Operations.

1856 General Instructions To Deputy Surveyors (Illinois and Missouri).

Manual Of Instructions

(Issued by the Commissioner of the General Land Office)

1855 Manual of Instructions.

1864 Instructions to Surveyors Generals, An Addendum to the 1855 Manual.

1871 Manual of Instructions.

1881 Manual of Instructions.

1890 Manual of Instructions.

1894 Manual of Instructions.

1902 Manual of Instructions.

1908 Manual of Instructions.

1930 Manual of Instructions [Note: there are at least two preprints of several chapters of this manual].

1947 Manual of Instructions.

1973 Manual of Instructions.

Circulars

Restoration of Lost or Obliterated Corners

1879 [Note: reprinted in the column "Surveyor and the

Law" *Surveying And Mapping;* vol. XXXVII, No. 3; pp. 261-261; 1977.]

1883 Circular.

1896 Circular.

1909 Circular (Reprinted 1916).

1939 Circular.

1952 Circular (Reprinted 1955).

1963 Circular.

1974 Circular.

APPENDIX C

On 'Reestablishing Of Lost Corners'

For many years, land surveyors performing surveys in the public domain have studied procedures to reestablish corners set by deputy surveyors. Readers of correspondence from county surveyors and consulting surveyors to the commissioner of the General Land Office or various surveyor generals will discover numerous inquiries concerning "techniques" and procedures to employ in "setting" center of section or reestablishing *lost* corners. By the late 1870's these inquiries were quite numerous.

In 1883, the General Land Office published a circular entitled: *Restoration of Lost and Obliterated Corners* (dated March 13, 1883). Since 1883, six additional editions have been published: October 16, 1896; June 1, 1909 (reprinted July 11, 1955, and 1960); June 3, 1963 (reprinted in 1965, 1968, and 1974). Few copies of the earlier editions are available for study. Recently, Carlisle Madson, L.S., of Hopkins, Minnesota, and R. "Ben" Buckner of Columbus, Ohio, collected copies of each edition and published them in a single volume (hard bound).

Prior to the 1883 edition of the circular the General Land Office under the supervision of Acting Commissioner J.M. Armstrong published a three-page circular on lost corners. The following is a copy of this circular (dated November 1, 1879).

[page 1]

DEPARTMENT OF THE INTERIOR
General Land Office
November 1, 1879

This Office being in receipt of many letters making inquiry in regard to the proper method of subdividing sections of the public lands and restoring lost corners of the public surveys, the following general rules have been prepared as a reply to such inquiries. The rules for subdivision are based upon the laws governing the survey of the public lands. There being no special law in regard to the re-establishment of lost corners, the rule given below is to be considered merely as an expression of the opinion of this Office on the subject. When cases arise which are not covered by these rules and the advice of this Office in the matter is desired, the letter

of inquiry should, in every instance, contain a description of the particular tract or corner with reference to township, range, and section of the public surveys, to enable the Office to consult the record.

Subdivision of Sections

Under the provisions of the Act of Congress approved February 11, 1805, the course to be pursued in the subdivision of sections is to run straight lines from the established quarter-section corners - United States surveys - to the opposite corresponding corners, and the point of intersection of the lines so run will be the corner common to the several quarter-sections, or, in other words, the legal center of the section.

In the subdivision of fractional quarter-sections where no opposite corresponding corners have been or can be fixed, the subdivision lines should be ascertained by running from the established corners due north, south, east, or west lines, as the case may be, to the water-course, Indian boundary line, or other external boundary of such fractional section.

The law presupposes the section lines surveyed and marked in the field by the United States deputy surveyors to be due north and south or east and west lines, but in actual experience this is not always the case; hence, in order to carry out the spirit of the law, it will be necessary, in running the subdivisional lines through fractional sections, to adopt mean courses where the section lines are not due lines, or to run the subdivision line parallel to the section line when there is no opposite section line.

Upon the lines closing on the north and west boundaries of a township, the quarter-section corners are established by the United States deputy surveyors at precisely forty chains to the north or west of the last interior section corners, and the excess or deficiency in the measurement is thrown on the outer tier of lots, as per Act of Congress approved May 10, 1800.

[page 2]

In the subdivision of quarter-sections the quarter-quarter corners are to be placed at points equidistant between the section and quarter-section corners and between the quarter corners and the common center of the section, *except* on the last half mile of the lines closing on the north or west boundaries of a township, where they should be placed at twenty chains, proportionate measurement, to the north or west of the quarter-section corner.

The subdivision lines of fractional quarter-sections should be run from points on the section lines intermediate between the section and quarter-section corners due north, south, east, or west, to the lake, water-course, or reservation which renders such tracts fractional.

When there are double sets of section corners on township and range lines, the quarter corners for the sections south of the township lines and east of the range lines are not established in the field by the United States surveyors, but in subdividing such sections said quarter corners should be so placed as to suit the *calculations of the areas of the quarter-sections adjoining the township boundaries* as expressed upon the official plat, adopting proportionate measurements where the present measurements of the north or west boundaries of the sections differ from the original measurements.

Re-establishment of Lost Corners

The original corners, when they can be found, must stand as the true corners they were intended to represent, even though not exactly where strict professional care might have placed them in the first instance.

Missing corners should be re-established in the identical localities they originally occupied. When the point cannot be determined by the existing landmarks in the field, resort must be had to the field notes of the original survey. The law provides that the lengths of the lines as stated in the field notes shall be considered as the true lengths thereof, and the distances between corners set down in the field notes constitute proper data from which to determine the true locality of a missing corner; hence the rule that all such should be restored at distances proportionate to the original measurements between existing original corners. That is, if the measurement between two existing corners differs from that stated in the field notes, the excess or deficiency should be distributed proportionately among the intervening section lines between the said existing corners standing in their original places. Missing corners on standard, township, and range lines should be restored by proportionate measurement between the nearest existing original corners on those lines. Missing section corners in the interior of townships should be re-established at proportionate distances between the nearest existing original corners *north* and *south* of the missing corners.

[page 3]

As has been observed, no existing original corner can be disturbed, and it will be plain that any excess or deficiency in measurements between existing corners cannot in any degree affect the distances beyond said existing corners, but must be added or subtracted proportionately to or from the intervals embraced between the corners which are still standing.

J. M. Armstrong,
Acting Commissioner

Note that the last sentence on page 2 of this circular was changed in the 1883 edition of the circular. The number of monuments established by this rule is unknown. Although these instructions were only "in effect" from November 1, 1879, to March 13, 1883, the exact dates when every surveyor employed the technique is uncertain. It is conceivable that one or more surveyors may have continued this practice for several years, and even decades.

In time, these monuments gained acceptance, and these monuments might have been employed to reestablish other lost corners. The implications of this set of instructions becomes more apparent and reinforces the axiom that the surveyor must know, understand, and interpret all the available evidence.

Since this circular was truly the first general circular to discuss reestablishing lost corners, it should be known as the first circular. However, since the 1883 circular has been known as the first edition, the 1879 circular should bear the title of "the zeroth edition."

Herbert W. Stoughton, P.E., L.S.
Geodetic Engineer

Reprinted from *Surveying And Mapping*; vol. XXXVII, No. 3 pp. 261-261; September 1977.

APPENDIX D

FEDERAL STATUTES

The following is a compilation of statutes pertaining to the Public Domain in general and Minnesota in particular which may be of interest to surveyors, attorneys, and title companies. The material is compiled from *Digest Of Public Land Laws* [L.C. No. 68-61584; Government Printing Office; June 1978].

1. Surveys (Also see Evidence).

A. Of The Public Lands.

May 18, 1796	ch. 29	1 Stat. 464
April 29, 1816	ch. 151	3 Stat. 325
March 3, 1831	ch. 116	4 Stat. 492
March 3, 1853	ch. 146	10 Stat. 254
April 24, 1874	ch. 127	18 Stat. 34
Aug. 9, 1876	ch. 256	19 Stat. 126
May 10, 1800	ch. 55	2 Stat. 73
April 29, 1950	ch. 134	64 Stat. 93
March 3, 1925	ch. 462	43 Stat. 1144
July 16, 1946	[Reorg. Plan No. 3, Sec. 403]	60 Stat. 1100
	Rev. Stat. §§ 2223, 2395, 2476 (1878)	
	43 USC §§ 52, 751, 931 (1964)	
Feb. 11, 1805	ch. 14	2 Stat. 313
April 24, 1820	ch. 51	3 Stat. 566
	43 USC § 752 (1964)	

B. Subdivision Of Sections - Quantities Purchased At Private Sales - Lines Of Division Of Half-Quarter Section.

Aug. 5, 1832	ch. 65	4 Stat. 503
	Rev. Stat. §§ 2354, 2397 (1878)	
	43 USC §§ 673, 753 (1964)	

C. Departure From Rectangular Surveys.

March 3, 1853	ch. 145	10 Stat. 244
April 12, 1950	ch. 134	64 Stat. 93
	Rev. Stat. §§ 2224, 2410 (1878)	
	43 USC §§ 57, 770 (1964)	

D. Resurveys Or Retracements.

1. Of Undisposed Lands.

March 3, 1909 ch. 271 35 Stat. 845
43 USC § 772 (1964)

2. Of Township Lands In Areas of Privately Owned Lands.

Sept. 21, 1918 ch. 175 40 Stat. 965
43 USC § 773 (1964)

E. Of Public Lands Within Limits Of Land Grants.

June 25, 1910 ch. 406 36 Stat. 834
43 USC §§ 908-911 (1964)

F. Costs (Expenses).

1. Of Mineral Survey.

March 3, 1901 ch. 830 31 Stat. 1003
43 USC § 60 (1964)

2. Deposit Of Costs - Repayment Of Excess.

Feb. 24, 1909 ch. 180 35 Stat. 645
43 USC § 761 (1964)

3. Payment For Survey Prior To Patent By Railroad Companies.

July 31, 1876 ch. 246 19 Stat. 121
43 USC §§ 757, 881 (1964)

4. Collection Of Costs And Taxation Of Railroad Grant Lands.

July 10, 1886 ch. 764 24 Stat. 143
43 USC §§ 882-885 (1964)

5. Surveys Of Lands Granted To Railroads - Application And Deposit.

Feb. 27, 1899 ch. 205 30 Stat. 892
43 USC § 887 (1964)

2. Surveyors.

A. Surveyor General; Abolition Of Office.

March 3, 1925 ch. 462 43 Stat. 1144

B. Appointment (Bureau Of Land Management).

July 16, 1946	Reorg. Plan. No. 3 Sec. 403	60 Stat. 1100
	43 USC §§ 52, 751 et seg. (1964)	

C. Protection Of.

May 29, 1830	ch. 163	4 Stat. 417
	Rev. Stat. § 2413 (1878)	
	43 USC § 774 (1964)	
June 25, 1948	ch. 645	62 Stat. 756, 787
May 24, 1949	ch. 139	63 Stat. 93, 95
Oct. 31, 1951	P.L. 248, ch. 655	65 Stat. 721
June 27, 1952	P.L. 414, ch. 477	66 Stat. 276
July 29, 1958	P.L. 85 - 568	72 Stat. 434
July 2, 1962	P.L. 87 - 518	76 Stat. 132
Aug. 27, 1964	P.L. 88 - 493	78 Stat. 610
July 15, 1965	P.L. 89 - 74	79 Stat. 234
	18 USC § 1114, 1851 - 1863 (1966)	

3. Evidence.

A. Patents.

1. Land Patent Papers As Evidence.

Jan. 23, 1823	ch. 6	3 Stat. 721
July 4, 1836	ch. 352	5 Stat. 107
	Rev. Stat. § 460 (1878)	
	43 USC § 18 (1964)	

2. Copies Of Records As Evidence.

March 3, 1853	ch. 145	10 Stat. 244
April 12, 1950	ch. 134	64 Stat. 93
	Rev. Stat. §§ 2224, 2410 (1878)	
	43 USC §§ 57, 770 (1964)	

3. Authenticated Patent Papers As Evidence In Court.

April 19, 1904	ch. 1398	33 Stat. 186
	43 USC § 13 (1964)	

B. Survey Records.

1. Plat Of Survey And Transcript Of Records As Evidence.

March 3, 1831	ch. 156	4 Stat. 493
	Rev. Stat. § 2225 (1878)	
	43 USC § 58 (1964)	

2. Field Notes - Delivery To States - Right Of Access.

Jan. 22, 1853	ch. 24	10 Stat. 152
	Rev. Stat. §§ 2219-2221 (1878)	
	43 USC §§ 53, 55, 56 (1964)	

3. Forest Reserve Act Of 1897.

June 4, 1897	ch. 2	30 Stat. 34-36, 43, 44
March 4, 1907	ch. 2907	34 Stat. 1269
March 3, 1925	ch. 462	43 Stat. 1144
	16 USC §§ 424, 473-482, 483, 551 (1964)	

C. Miscellaneous.

1. Exemplification Of Records Of Land Office As Evidence.

March 3, 1843	ch. 95	5 Stat. 627

2. District Land Offices - Fees For Transcripts Of Records - Admission As Evidence.

March 22, 1904	ch. 748	33 Stat. 144
	43 USC § 83 (1964)	

4. Patents (see Evidence).

A. Correction Of Errors In Sales Of Public Lands.

March 3, 1819	ch. 98	3 Stat. 526
May 24, 1824	ch. 138	4 Stat. 31
May 24, 1828	ch. 96	4 Stat. 301
March 3, 1853	ch. 148	10 Stat. 257
Feb. 24, 1909	ch. 181	35 Stat. 645
May 21, 1926	ch. 353	44 Stat. 591
	Rev. Stat. §§ 2369-2372 (1878)	
	43 USC §§ 693, 694, 697 (1964)	

B. Mistake In Location Of Warrants.

March 3, 1853	ch. 147	10 Stat. 257
	43 USC § 695 (1964)	

C. Surrender Of Old Patents And Issue Of New Patents.

March 3, 1853	ch. 152	10 Stat. 258
	Rev. Stat. § 2456 (1878)	
	43 USC § 1163 (1964)	

D. Sales - Purchases - Certificates.

May 23, 1828	ch. 71	4 Stat. 286
	Rev. Stat. § 2361 (1878)	
	43 USC § 688 (1964)	

E. Engrossing And Recording Of Patents.

March 2, 1895	ch. 177	28 Stat. 807
	43 USC § 16 (1964)	

F. Correction Of Errors Made In Land Office.

March 9, 1904	ch. 503	33 Stat. 64
	43 USC § 1167 (1964)	

G. Method Of Issuing Patents For Public Lands.

June 17, 1948	ch. 496	62 Stat. 476
	43 USC § 15 (1964)	

H. Recordation, Endorsement And Publication Of Scrip, Lieu Selections, Bounty Land Warrants And Similar Rights.

Aug. 5, 1955	ch. 573	49 Stat. 534
Aug. 31, 1964	P.L. 88 - 545	78 Stat. 751

I. Amendment Of Patented Entries Or Exchanges - Quit Claim Deed Where Original Conveyance Has Been Recorded.

April 28, 1930	ch. 219	46 Stat. 257
	43 USC § 872 (1964)	

J. Reconveyance Of Title To Lands Acquired By Mistake.

July 8, 1943	ch. 197	57 Stat. 388
Oct. 23, 1962	P.L. 87 - 869	76 Stat. 1157
	5 USC § 567 (1964)	

K. Title To Specified Lands On Proof Of Adverse Possession.

Aug. 7, 1946	ch. 772	60 Stat. 872
	43 USC § 1100, 1101 (1964)	

L. Color Of Title Act.

Dec. 22, 1928	ch. 47	45 Stat. 1069
July 28, 1953	P.L. 159, ch. 254	67 Stat. 227
	43 USC §§ 1068-1068b (1964)	

M. Subject To Water Rights.

July 9, 1870	ch. 235	16 Stat. 218
March 3, 1891	ch. 561	26 Stat. 1097
	Rev. Stat. § 2340 (1878)	
	30 USC § 52 (1964)	
	43 USC § 661 (1964)	

N. Minerals Not Included in Land Grants.

Jan. 30, 1865		13 Stat. 567
	Rev. Stat. § 2346 (1878)	
	30 USC § 50 (1964)	

O. Disposition Of Patents Of Persons Dead Before Issuance.

May 20, 1836	ch. 76	5 Stat. 31
	Rev. Stat. § 2448 (1878)	
	43 USC § 1152 (1964)	

P. Issue For Confirmed Claims.

Dec. 22, 1854	ch. 10	10 Stat. 599
	Rev. Stat. § 2447 (1878)	
	43 USC § 1151 (1964)	

Q. Delivered Only Upon Payment Of Costs Of Private Land - Claims Survey.

March 3, 1885	ch. 360	23 Stat. 499
	43 USC § 758 (1964)	

R. For Locations Made With Land Scrip.

May 30, 1894	ch. 86	28 Stat. 84
	43 USC § 1156 (1964)	

S. Method Of Issue For Public Lands.

June 17, 1948	ch. 496	62 Stat. 476
	43 USC § 15 (1964)	

5. State Enabling Acts (Statehood).

A. Minnesota.

Feb. 26, 1857	ch. 60	11 Stat. 166

B. Michigan.

June 15, 1836	ch. 99	5 Stat. 49

C. Iowa.

March 3, 1845	ch. 48	5 Stat. 742

D. Wisconsin.

Aug. 6, 1846	ch. 89	9 Stat. 56
March 3, 1847	ch. 53	9 Stat. 178
May 29, 1848	ch. 50	9 Stat. 233

E. North Dakota and South Dakota (simultaneous).

Feb. 22, 1889	ch. 180	25 Stat. 676
May 7, 1932	ch. 172	47 Stat. 150
April 13, 1948	ch. 183	62 Stat. 170
Feb. 26, 1957	P.L. 85-6	71 Stat. 5

6. Eminent Domain - Immediate Possession.

Feb. 26, 1931	ch. 307	46 Stat. 1421
	40 USC §§ 258-258e (1964)	

7. School Lands (General) (also see Minnesota School Lands).

A. Indemnity Act.

Feb. 26, 1859	ch. 58	11 Stat. 385
Feb. 28, 1891		26 Stat. 796
Aug. 27, 1958		72 Stat. 928
	43 USC § 851 (1964)	

B. Land Grants In Aid Of Colleges.

1. General

April 14, 1864	ch. 58	13 Stat. 47

2. Agricultural College.

July 2, 1862	ch. 130	12 Stat. 503
March 3, 1883	ch. 102	22 Stat. 484
	7 USC §§ 301-308 (1964)	

3. Limitation Of Entries Authorized With Scrip Under Agricultural College Act.

July 27, 1868	ch. 256	15 Stat. 227

C. Selection Of School Lands From Surplus Ceded Indian Reservation Lands.

March 2, 1895	ch. 188	28 Stat. 899
	43 USC § 856 (1964)	

D. Confirmation Of Indemnity Selection In Lieu Of School Sections.

Feb. 11, 1903	ch. 543	32 Stat. 822
	43 USC § 1079 (1964)	

E. Dawson School Land Acts.

Jan. 25, 1927	ch. 57	44 Stat. 1026
July 11, 1956	P.L. 699, ch. 572	70 Stat. 529
	43 USC §§ 870, 871 (1964)	

F. Issuance Of Patents To States.

June 21, 1934	ch. 689	48 Stat. 1185
	43 USC § 871a (1964)	

8. Land Offices And Land Districts (General).

A. Discontinuance Of Land Office.

1. Completion Of Surveys.

June 12, 1840	ch. 36	5 Stat. 384
July 31, 1876	ch. 246	19 Stat. 121
June 5, 1924	ch. 264	43 Stat. 394
	Rev. Stat. §§ 2218, 2246, 2248 (1878)	
	43 USC §§ 54, 75, 122 (1964)	

2. Change Of Location.

March 3, 1853	ch. 97	10 Stat. 194, 204
March 3, 1853	ch. 144	10 Stat. 244
	Rev. Stat. §§ 2250, 2251 (1878)	
	43 USC §§ 125, 126 (1964)	

3. Conditions Precedent To Survey.

May 30, 1862	ch. 86	12 Stat. 409
Aug. 20, 1894	ch. 307	28 Stat. 423
	Rev. Stat. §§ 2252, 2401 (1878)	
	43 USC §§ 121, 759 (1964)	

B. Change Of Boundaries.

June 29, 1870	ch. 171	16 Stat. 171
	Rev. Stat. § 2253 (1878)	
	43 USC USC § 127 (1964)	

C. Creation Of New Land Districts.

May 31, 1872	ch. 241	17 Stat. 192
	Rev. Stat. § 2254 (1878)	
	43 USC § 128 (1964)	

9. Sales Of Public Lands (see Homesteads and Minnesota).

A. Bids - Price.

April 24, 1820	ch. 51	3 Stat. 566
March 3, 1887	ch. 107	19 Stat. 377
Dec. 16, 1930	ch. 14	46 Stat. 1029
	Rev. Stat. §§ 2357, 2397 (1878)	
	43 USC §§ 676, 678, 753 (1964)	

B. Isolated Tracts Act.

Aug. 3, 1846	ch. 78	9 Stat. 51
Feb. 26, 1895	ch. 133	28 Stat. 687
June 27, 1906	ch. 3554	34 Stat. 517
March 28, 1912	ch. 67	37 Stat. 77
March 9, 1928	ch. 164	45 Stat. 253
June 28, 1934	ch. 865	48 Stat. 1274
July 30, 1947	ch. 383	61 Stat. 630
	Rev. Stat. §§ 2450, 2451, 2455 (1878)	
	43 USC §§ 1161, 1162, 1171 (1964)	

C. Applicability Of Provisions Of Law Allowing Claims To Be Cured.

June 26, 1856	ch. 47	11 Stat. 22
	Rev. Stat. § 2457 (1878)	
	43 USC § 1164 (1964)	

D. Authorizing Condemnation.

Aug. 1, 1888	ch. 728	25 Stat. 357

E. Withdrawn Lands Restored To Public Domain.

June 20, 1890	ch. 438	26 Stat. 169

F. Abandoned Military Reservations - Lands Opened to Settlement.

Feb. 15, 1895	ch. 92	28 Stat. 664
	43 USC § 1080 (1964)	

G. Negotiation And Ratification Of Cession Of Indian Lands.

March 3, 1901	ch. 832	31 Stat. 1077
	43 USC § 1195 (1964)	

H. Sale For Cemetery Purposes.

March 1, 1907	ch. 2286	34 Stat. 1052
	43 USC § 682 (1964)	

I. Sale.

Sept. 19, 1964 P.L. 88-608 78 Stat. 988
43 USC §§ 1421-1427 (1966)

10. Highways, Railroads, Telegraph, Turnpikes, Etc. (see Minnesota).

A. Rights-Of-Way Grants And Easements.

1. Road, Railroad, And Turnpike.

Aug. 4, 1852 ch. 80 10 Stat. 28

2. Grant Of Lands To Aid Construction Of Koebuk, Fort Des Moines And Minnesota Railroad.

July 12, 1862 ch. 161 12 Stat. 543

3. Railroad Land Grant To Iowa (Apparently Applicable To Railroads Extending Into Minnesota).

May 12, 1864 ch. 84 13 Stat. 72

4. Railroad And Telegraph - Northern Pacific.

July 2, 1864 ch. 217 13 Stat. 365

5. Telegraph Company Over Public Lands.

July 24, 1866 ch. 230 14 Stat. 221

6. Federal Highway Grant, Canal Owners (Drainage).

July 26, 1866 ch. 262 14 Stat. 251
Rev. Stat. §§ 2339, 2447 (1878)
30 USC §§ 43, 46, 51 (1964)
43 USC §§ 661, 932 (1964)

7. St. Paul And Pacific Railroad Change Of Right-Of-Way.

May 3, 1871 ch. 144 16 Stat. 588

8. General Railroad Right-Of-Way Act.

March 3, 1875 ch. 152 18 Stat. 482
43 USC §§ 934-939 (1964)

9. Tramroad Act (Easements Across Public Land).

Jan. 21, 1895 ch. 37 28 Stat. 635
May 11, 1898 ch. 292 30 Stat. 404
43 USC § 956 (1964)

10. Over Forest Reservations Or Reservoir Sites.

March 3, 1899	ch. 427	30 Stat. 1233
	43 USC §§ 665, 958 (1964)	
	16 USC § 525 (1964)	

11. Through Certain Parks, Reservations And Other Lands.

Feb. 15, 1901	ch. 372	31 Stat. 790
	43 USC § 959 (1964)	
	16 USC §§ 79, 522 (1964)	

12. Railroad Forfeiture Act.

Feb. 15, 1909	ch. 191	35 Stat. 647
	43 USC § 940 (1964)	

13. Communication And Power.

March 4, 1911	ch. 238	36 Stat. 1253
May 27, 1952	P.L. 367, ch. 338	66 Stat. 95
	43 USC § 961 (1964)	
	16 USC §§ 5, 420, 523 (1964)	

14. Conveyance By Railroads to State, County Or Municipality.

May 25, 1920	ch. 197	41 Stat. 621
	43 USC § 913 (1964)	

15. Authority Of Attorney General To Grant Easements.

May 9, 1941	ch. 94	55 Stat. 183
	43 USC § 931a (1964)	

16. Permits, Leases, And Easements On Public Lands.

Sept. 3, 1954	ch. 1255	68 Stat. 1146
	43 USC §§ 931c, d (1964)	

17. To States For Highway Purposes.

July 6, 1960	P.L. 86-608	74 Stat. 363
	40 USC § 345c (1964)	

B. Grants - Other Than Right-Of-Way Or Easement.

1. Opening of Lands Along Pacific Railroads To Settlement (May Not Be A Grant To Railroads).

March 6, 1868	ch. 20	15 Stat. 39

2.a. Lieu Lands Act (Railroad Grant).

June 22, 1874 ch. 400 18 Stat. 194
43 USC § 888 (1964)

2.b. Rights of Entrymen Under Lieu Lands Act.

Aug. 29, 1890 ch. 819 26 Stat. 369
43 USC § 889 (1964)

3. Confirmation of Entries Within Railroad Grants Made Under Regulation of Land Department.

April 21, 1876 ch. 72 19 Stat. 35
43 USC §§ 890-892 (1964)

4. Enlargement Of Entries Within Railroad Grants.

May 6, 1886 ch. 88 24 Stat. 22
43 USC § 206 (1964)

5. Railroad Land Grant Adjustment Act.

March 3, 1887 ch. 376 24 Stat. 556
Feb. 12, 1896 ch. 18 29 Stat. 6
43 USC §§ 894-899 (1964)

6. Forfeiture Act.

Sept. 29, 1890 ch. 1040 26 Stat. 496
43 USC §§ 904-907 (1964)

7. Survey Of Lands Within Limits Of Railroad Grant To Aid In Adjustment.

March 2, 1895 ch. 189 28 Stat. 937
43 USC § 886 (1964)

8. Forfeiture Of Unsurveyed Land Grants By Railroads.

June 25, 1910 ch. 406 36 Stat. 834
43 USC §§ 908-911 (1964)

C. Miscellaneous.

1. Reduction Of Price Of Railroad Lands - Mineral Lands Excluded.

June 15, 1880 ch. 227 21 Stat. 238
43 USC §§ 679, 680 (1964)

2. Maintenance Of Telegraph Lines By Subsidized Railroads.

Aug. 7, 1888	ch. 772	25 Stat. 382

3. Limitation Of Time Limit For Suits To Vacate Land Patents For Disposition Of Claims.

March 2, 1896	ch. 39	29 Stat. 43
	43 USC §§ 900-902 (1964)	

11. Swamp Lands.

A. Grant.

March 2, 1849	ch. 87	9 Stat. 352

B. Act Of 1850.

Sept. 28, 1850	ch. 84	9 Stat. 519
March 12, 1860	ch. 5	12 Stat. 3
Feb. 19, 1874	ch. 30	18 Stat. 16
	Rev. Stat. §§ 2479-2481 (1878)	
	43 USC §§ 982-984 (1964)	

C. Indemnity.

March 2, 1855	ch. 147	10 Stat. 634
	Rev. Stat. § 2482 (1878)	
	43 USC § 981 (1964)	

D. Confirmation Of Selection By States.

March 3, 1857	ch. 117	11 Stat. 251
	Rev. Stat. § 2484 (1878)	
	43 USC § 986 (1964)	

E. Volstead Drainage Under State Laws Act.

May 20, 1908	ch. 181	35 Stat. 169
Sept. 5, 1916	ch. 327	39 Stat. 722
May 1, 1958	P.L. 85-387	72 Stat. 99
	45 USC §§ 1021-1027 (1964)	

F. Permanent Appropriations Repeal Act.

June 26, 1934	ch. 756	48 Stat. 1226
July 26, 1947	ch. 343	61 Stat. 501
	31 USC §§ 725b, c, r (1964)	

12. Grants To States (General).

A. For Seats Of Justice (County Seat).

May 26, 1824	ch. 169	4 Stat. 50
	Rev. Stat. § 2286 (1878)	
	43 USC § 858 (1964)	

B. Conveyance Of Fee - Simple Title By Certified List.

Aug. 3, 1854	ch. 201	10 Stat. 346
March 3, 1875	ch. 139	18 Stat. 475
	Rev. Stat. § 2449 (1878)	
	43 USC § 859 (1964)	

C. Of Unsurveyed Lands - Survey Prior To Transfer For Public Purposes.

June 24, 1966	P.L. 89-470	80 Stat. 220
	43 USC §§ 852a, 852b (1966)	

D. Survey Of Lands Granted To Specified States - Validation Of Veterans' Additional Homestead Acts.

Aug. 18, 1894	ch. 301	28 Stat. 394, 397
	43 USC §§ 276, 863 (1964)	

13. Flood Control Act.

Dec. 22, 1944	ch. 665	58 Stat. 889-891
July 24, 1946	ch. 596	60 Stat. 642
Sept. 3, 1954	ch. 1264	68 Stat. 1266
Oct. 23, 1962	P.L. 87-874	76 Stat. 1195
Sept. 9, 1964	P.L. 88-578	78 Stat. 899
Oct. 27, 1965	P.L. 89-298	79 Stat. 1088
	43 USC § 390 (1966)	
	16 USC §§ 460d, 825s (1966)	

14. Minerals And Mining (see Patents).

A. Actions For Recovery Of Mining Titles.

Feb. 27, 1865	ch. 64	13 Stat. 440
	Rev. Stat. § 910 (1878)	
	30 USC § 53 (1964)	

B. Mining Law Of 1872.

May 10, 1872	ch. 152	17 Stat. 91
Feb. 11, 1875	ch. 41	18 Stat. 315
Jan. 22, 1880	ch. 9	21 Stat. 61
April 28, 1904	ch. 1796	33 Stat. 545

Aug. 24, 1921	ch. 84	42 Stat. 186
July 3, 1942	ch. 486	56 Stat. 647
June 22, 1944	ch. 271	58 Stat. 324
June 21, 1949	ch. 232	63 Stat. 214
Aug. 23, 1958	P.L. 85-736	72 Stat. 829
March 18, 1960	P.L. 86-390	74 Stat. 7
Feb. 25, 1920	ch. 85	41 Stat. 437
March 3, 1891	ch. 561	26 Stat. 1097
	Rev. Stat. §§ 2318-2329, 2331, 2333-2338 (1878)	
	30 USC §§ 22-24, 26-30, 33-35, 37, 39-42, 47 (1964)	

C. Mineral Land Law - Minnesota Excepted.

Feb. 18, 1873	ch.. 159	17 Stat. 465
March 3, 1891	ch. 561	26 Stat. 1097
Feb. 25, 1920	ch. 85	41 Stat. 437
	30 USC § 48 (1964)	

D. Coal Lands.

1. Entry Under Nonmineral Land Laws.

March 3, 1909	ch. 270	35 Stat. 844
	30 USC § 81 (1964)	

2. Agricultural Entry.

June 22, 1910	ch. 318	36 Stat. 583
April 30, 1912	ch. 99	37 Stat. 105
June 16, 1955	P.L. 76	69 Stat. 138
	30 USC §§ 83-85 (1964)	

3. Effects Of Reclassification On Patents.

April 14, 1914	ch. 55	38 Stat. 335
	30 USC § 82 (1964)	

E. Agricultural Entry Of Lands Containing Phosphate, Nitrate, Potash, Oil, Or Asphalt.

July 17, 1914	ch. 142	38 Stat. 509
June 16, 1955	ch. 145	69 Stat. 138
June 20, 1956	ch. 652	70 Stat. 592
	30 USC §§ 121-123 (1964)	

15. Homesteads.

A. Homestead Act - 160 Acres.

May 20, 1862	ch. 75	12 Stat. 392
March 21, 1864	ch. 38	13 Stat. 35

June 21, 1866	ch. 127	14 Stat. 67
Feb. 11, 1874	ch. 25	18 Stat. 15
March 13, 1874	ch. 55	18 Stat. 22
June 22, 1874	ch. 394	18 Stat. 192
Feb. 23, 1875	ch. 99	18 Stat. 334
March 3, 1875	ch. 131	18 Stat. 420
April 21, 1875	ch. 72	19 Stat. 35
March 3, 1877	ch. 125	19 Stat. 405
March 3, 1881	ch. 153	21 Stat. 511
March 3, 1891	ch. 561	26 Stat. 1097
June 3, 1896	ch. 312	29 Stat. 197
June 6, 1912	ch. 153	37 Stat. 124
Aug. 31, 1918	ch. 166	40 Stat. 957
Sept. 13, 1918	ch. 173	40 Stat. 960
April 28, 1922	ch. 155	42 Stat. 502
	Rev. Stat. §§ 2289-2298, 2300, 2301 (1878)	
	43 USC §§ 161-164, 169, 173, 175, 183, 184, 201, 211, 255 (1964)	

B. Three Year Homestead Act.

June 21, 1866	ch. 127	14 Stat. 67
June 18, 1874	ch. 308	18 Stat. 81
June 6, 1912	ch. 153	37 Stat. 123
	Rev. Stat. §§ 2289, 2291, 2297, 2302 (1878)	
	43 USC §§ 164, 169, 171, 184, 201 (1964)	

C. Veteran Homesteads.

1. General Act.

June 8, 1872	ch. 338	17 Stat. 333
March 1, 1901	ch. 674	31 Stat. 847
Feb. 25, 1919	ch. 37	40 Stat. 1161
April 6, 1922	ch. 122	42 Stat. 491
Sept. 21, 1922	ch. 357	42 Stat. 990
	Rev. Stat. §§ 2304-2309 (1878)	
	43 USC §§ 239, 271, 272, 274, 277, 278 (1964)	

2. Service In World War I and Mexican Border Operations.

Feb. 25, 1919	ch. 37	40 Stat. 1161
	43 USC § 272a (1964)	

3. Benefits For Wounds Or Disability.

April 6, 1922	ch. 122	42 Stat. 491
	43 USC § 273 (1964)	

D. Indians.

1. Indian Homestead Act.

March 3, 1875	ch. 131 43 USC § 189 (1964)	18 Stat. 420

2. Indian Land Patent Act.

July 4, 1884	ch. 180 43 USC § 190 (1964)	23 Stat. 76

E. On Ceded Lands - Opened To Entry.

1. Abandoned Military Reservations.

Aug. 23, 1894	ch. 314 43 USC §§ 1077, 1078 (1964)	28 Stat. 491
Feb. 15, 1895	ch. 92 43 USC § 1080 (1964)	28 Stat. 664

2. Indian Reservations Or Indian Lands.

Feb. 25, 1925	ch. 326 43 USC § 187 (1964)	43 Stat. 981
June 21, 1934	ch. 690 43 USC § 187a (1964)	48 Stat. 1185

F. Railroad Grants.

1. Homestead Act.

March 3, 1879	ch. 191 43 USC § 204 (1964)	20 Stat. 472

2. Entries On Odd Number Sections.

July 1, 1879	ch. 60 43 USC § 205 (1964)	21 Stat. 46

G. Right Of Homestead Settler To Transfer Claim For Public Purposes.

March 3, 1873	ch. 266	17 Stat. 602
March 3, 1891	ch. 561	26 Stat. 1097
March 3, 1905	ch. 1424 Rev. Stat. § 2288 (1878) 43 USC § 174 (1964)	33 Stat. 991

H. Relief Of Settlers - Relinquishment Of Claims To Land.

May 14, 1880	ch. 89	21 Stat. 140

July 26, 1892	ch. 251	27 Stat. 270
Aug. 9, 1912	ch. 280	37 Stat. 267
	43 USC §§ 166, 185, 202, 263 (1964)	

I. Limitation Of Enlarged Entries (Acreage Limitation) And Reservation Of Rights Of Way.

Aug. 30, 1890	ch. 837	26 Stat. 391
March 3, 1891	ch. 561	26 Stat. 1101
	43 USC §§ 212, 662, 945 (1964)	
	16 USC § 446 (1964)	

J. Free Homestead Act.

May 17, 1900	ch. 479	31 Stat. 179
	43 USC § 179 (1964)	

K. Additional And Enlarged Entries.

1. Second Entry.

May 22, 1902	ch. 821	32 Stat. 203
	43 USC § 187b (1964)	

2. Original Entry Was Less Than 160 Acres.

April 28, 1904	ch. 1776	33 Stat. 527
Aug. 3, 1950	ch. 521	64 Stat. 398
	43 USC § 213 (1964)	

3. Right To Make Second Entry.

Feb. 8, 1908	ch. 19	35 Stat. 6

4. Enlarged Homestead Act.

Feb. 19, 1909	ch. 160	35 Stat. 639
June 6, 1912	ch. 153	37 Stat. 123
March 3, 1915	ch. 84	38 Stat. 953
March 4, 1915	ch. 150	38 Stat. 1163
July 3, 1916	ch. 220	39 Stat. 344
March 4, 1923	ch. 245	42 Stat. 1445
	43 USC § 218 (1964)	
June 17, 1910	ch. 298	36 Stat. 531
Sept. 5, 1916	ch. 440	39 Stat. 724
	43 USC § 219 (1964)	

5. Homestead Act (640 Acres) - Stock Raising.

Dec. 29, 1916	ch. 9	39 Stat. 862
March 4, 1923	ch. 245	42 Stat. 1445

June 6, 1924 ch. 274 43 Stat. 469
Feb. 28, 1931 ch. 328 46 Stat. 1454
43 USC §§ 291-301 (1964)

L. Enlarged Homestead Act - Miscellaneous.

1. Preferential Entry.

Aug. 9, 1912 ch. 280 37 Stat. 267
43 USC § 223 (1964)

2. Applications For Entry Of Nondesignated Lands.

March 4, 1915 ch. 148 38 Stat. 1162
43 USC § 220 (1964)

3. Title And Patent To Less Than One-Quarter Section.

Feb. 20, 1917 ch. 98 39 Stat. 925
March 4, 1921 ch. 162 41 Stat. 1433
43 USC §§ 215, 216 (1964)

4. Entries In National Forests.

March 4, 1923 ch. 245 42 Stat. 1445
43 USC §§ 222, 302 (1964)

M. Affidavits, Patents, Etc., Affecting Title.

1. Affidavit Of Occupation.

March 3, 1877 ch. 122 19 Stat. 403

2. Form And Requirement Of Final Proof Of Entry.

March 3, 1879 ch. 192 20 Stat. 472
43 USC § 251 (1964)

3. Confirmation Of Entries Prematurely Commuted.

June 3, 1896 ch. 312 29 Stat. 197
43 USC § 173 (1964)

4. Validation Of Certain Entries.

Aug. 24, 1912 ch. 381 37 Stat. 506

5. Leave Of Absence For Settlers On Unsurveyed Lands.

July 3, 1916 ch. 214 39 Stat. 341
43 USC § 232 (1964)

6. Final Proofs - Election Of Law (Three Year Homestead Act).

March 14, 1913	ch. 149	37 Stat. 925
	43 USC § 256 (1964)	

N. Entry - Miscellaneous Legislation.

1. Right To New Entry After Forfeiture Of Prior Entry Without Fault.

Sept. 5, 1914	ch. 294	38 Stat. 712
	43 USC § 182 (1964)	

2. Entry On Land Containing Coal, Oil, Or Gas.

March 8, 1922	ch. 96	42 Stat. 415
Aug. 23, 1958	P.L. 85-725	72 Stat. 730
	43 USC §§ 376, 377 (1964)	

O. Opening And Settlement Of Lands Restored To Entry After Withdrawals.

Sept. 30, 1913	ch. 15	38 Stat. 113
	43 USC §§ 151, 152 (1964)	

16. Townsites (see Minnesota).

A. Land Grants To States.

1. Town Site Act Of 1864 (and 1867).

July 1, 1864	ch. 205	13 Stat. 343
March 3, 1865	ch. 107	13 Stat. 529
March 2, 1867	ch. 177	14 Stat. 541
June 8, 1868	ch. 53	15 Stat. 67
July 1, 1870	ch. 193	16 Stat. 183
Aug. 24, 1954	ch. 905	68 Stat. 792
	43 USC §§ 713-715, 718-724 (1964)	
June 23, 1887	ch. 469	18 Stat. 254
	Rev. Stat. § 2387 et seg. (1878)	
	43 USC §§ 718-723 (1964)	

2. Election Of Inhabitants To Enter, Subject To Trusts.

June 8, 1868	ch. 53	15 Stat. 67
	Rev. Stat. § 2394 (1878)	
	43 USC § 724 (1964)	

3. Maximum Lands Excluded - Excess Opened To Settlement - Additional And Supplemental Entries.

March 3, 1877	ch. 113	19 Stat. 392
	43 USC §§ 725-727 (1964)	

4. Reservation And Survey.

March 3, 1863	ch. 80	12 Stat. 754
	Rev. Stat. §§ 2380, 2381 (1878)	
	43 USC §§ 711, 712 (1964)	

17. Minnesota.

A. Establishment Of Land Offices And Land Districts.

Aug. 30, 1852	ch. 102	10 Stat. 40
April 12, 1854	ch. 35	10 Stat. 274
July 8, 1856	ch. 58	11 Stat. 26
July 25, 1868	ch. 238	15 Stat. 184
March 12, 1872	ch. 43	17 Stat. 38

B. Restoration Of Lands To The Public Domain and Homestead Entry.

1. Fort Riley, Minnesota.

April 1, 1880	ch. 40	21 Stat. 69

2. Fort Abercrombie, Minnesota.

July 15, 1882	ch. 293	22 Stat. 168

3. Former Mille Lac Indian Reservation, Minnesota.

May 27, 1898	Res. No. 40	30 Stat. 745

4. Opening Of Chippewa Lands Ceded To U.S.

June 27, 1902	ch. 1157	32 Stat. 403

5. General.

March 3, 1905	ch. 1421	33 Stat. 990
May 16, 1906	ch. 2462	34 Stat. 195
Aug. 6, 1914	ch. 229	38 Stat. 683

6. Gull Lake Reservoir.

May 29, 1908	ch. 220	35 Stat. 465, 466, 469, 471

C. School Lands.

1. For Universities.

Feb. 19, 1851	ch. 10	9 Stat. 568
March 2, 1861	ch. 79	12 Stat. 208
July 8, 1870	ch. 227	16 Stat. 196

June 29, 1948 ch. 720 62 Stat. 1100

2. Authority To Regulate School Lands.

Feb. 19, 1851 ch. 10 9 Stat. 568

3. Authority Of State To Make In Lieu Selections For School Lands.

March 3, 1857 Res. No. 12 11 Stat. 254
March 3, 1859 ch. 131 11 Stat. 510

4. Grant In White Earth Indian Reservation For Missionary And School Purposes.

April 18, 1874 ch. 111 18 Stat. 31

D. Grants For Forestry, Parks, Fisheries, Wildlife, Etc.

1. Forestry Purposes.

April 28, 1904 ch. 1780 33 Stat. 536

2. Establishment Of National Forest.

May 23, 1908 ch. 193 35 Stat. 268

3. Promotion Of Production Of Forestry Products.

July 10, 1930 ch. 881 46 Stat. 1020
16 USC §§ 577-577b (1964)

4. Exchange Of Lands And Additions To National Parks, Forests, And Reservations.

Dec. 7, 1942 ch. 691 56 Stat. 1042

5. Right To Condemn Lands For Fish Propagation And Other Purposes.

June 4, 1948 ch. 416 62 Stat. 337

6. Protection Of Certain Areas Within Superior National Forest.

June 22, 1948 ch. 593 62 Stat. 568
June 22, 1956 P.L. 607, ch. 425 70 Stat. 326
16 USC §§ 577c-577h (1964)

7. Addition Of Lands To Chippewa National Forest.

Oct. 5, 1949 ch. 597 63 Stat. 702

8. Exchange Of Lands With Federal Government For Wildlife Refuge Purposes.

Oct. 23, 1951	ch. 538	65 Stat. 602

9. Upper Mississippi River Wildlife And Fish Refuge Act.

June 7, 1924	ch. 346	43 Stat. 650
June 18, 1934	ch. 602	48 Stat. 1015
May 12, 1928	ch. 534	45 Stat. 502
	16 USC §§ 721-731 (1964)	
June 13, 1944	ch. 243	58 Stat. 274

10. Grant Of Lands For Public Park.

Aug. 3, 1892	ch. 362	27 Stat. 347

11. Exchange Of Lands In Superior National Forest.

Oct. 23, 1962	P.L. 87-848	76 Stat. 1118

E. Swamp Lands, Drainage, Etc.

1. Extension Of Swamp Lands Act Of 1850.

March 12, 1860	ch. 5	12 Stat. 3
	Rev. Stat. § 2490 (1878)	
	43 USC § 988 (1964)	

2. Volstead Drainage Under State Laws Act.

May 20, 1908	ch. 181	35 Stat. 169
Sept. 5, 1916	ch. 327	39 Stat. 722
May 1, 1958	P.L. 85-387	72 Stat. 99
	43 USC §§ 1021-1027 (1964)	

3. Water Reserve Lands, Subject To Railroad Rights Of Way.

Feb. 27, 1901	ch. 614	31 Stat. 815
	43 USC § 943 (1964)	

F. Grants To The State (see Enabling Act).

1. To Aid Railroad Construction, Etc.

March 3, 1857	ch. 99	11 Stat. 195
May 5, 1864	ch. 79	13 Stat. 64
July 4, 1866	ch. 168	14 Stat. 87
July 13, 1866	ch. 183	14 Stat. 97

2. For Aid Of Navigation And For Completing A Lock And Dam.

July 23, 1868	ch. 228	15 Stat. 169

3. Grant Of Lieu Lands.

March 3, 1879	ch. 171	20 Stat. 352

4. Transfer Of Lands To State.

May 1, 1958	P.L. 85-387 43 USC §§ 1029-1034 (1964)	72 Stat. 99

G. Federal Agency Activities.

1. Authority Of Secretary Of Interior To Adjust Specified Land Claims.

May 8, 1922	ch. 182	42 Stat. 506

2. Pipestone National Monument Established.

Aug. 25, 1937	ch. 768 16 USC § 445c (1964)	50 Stat. 804

3. Transfer Of Lands Within Fort Snelling To The Secretary Of Interior.

Sept. 6, 1950	ch. 896	64 Stat. 595, 692

4. Addition Of Lands To Pipestone National Monument.

June 18, 1956	ch. 401 16 USC § 445d (1964)	70 Stat. 290

5. Extension Of Authority For Administration Of Public Lands In Northern, Minnesota, To Additional Lands.

June 27, 1956	ch. 425 16 USC §§ 577d-1, g-1 (1964)	70 Stat. 326

6. Grand Portage National Monument Established.

Sept. 2, 1958	P.L. 85-910 16 USC § 405.0-10 (1964)	72 Stat. 1751

7. Sale Of Isolated Tracts Of Ceded Chippewa Indian Lands.

Feb. 4, 1919	ch. 13 43 USC § 1172 (1964)	40 Stat. 1055

H. Miscellaneous Federal Grants.

1. To St. Paul For Public Purposes.

May 29, 1928	ch. 867	45 Stat. 956

2. To Duluth For A Public Highway.

Sept. 27, 1944	ch. 427	58 Stat. 753

I. Town Site Laws Extended To Ceded Indian Lands.

Feb. 9, 1903	ch. 531 43 USC § 731 (1964)	32 Stat. 820

18. Miscellaneous.

A. Implementation Of Land Laws By Regulations.

Sept. 28, 1850	ch. 85 Rev. Stat. § 2478 (1878) 43 USC § 1201 (1964)	9 Stat. 52

B. Establishment Of Boundaries Of National Forests Under Standard Procedures.

March 3, 1899	ch. 424 16 USC § 488 (1964)	30 Stat. 1074, 1097

APPENDIX E

Proposed Legislation (7 December 1977 Version)

A bill for an act relating to the public land surveys; authorizing the counties to contract for the preservation and remonumentation of the United State public land survey; providing for the financing thereof; appropriating money; amending Minnesota Statutes 1976, Sections 287.21, Subdivision 2; 287.25; 287.28; 287.29, Subdivision 1, and 389.011, Subdivision 2.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. (Legislative Findings.) The legislature finds that it is in the public interest that the public records and the monuments established by the United States public land survey be perpetuated and preserved, and that in those instances where the monuments have been destroyed, obliterated, or obscured to an extent that they are difficult to locate, that they be reestablished with permanent monuments and their positions perpetuated. The legislature further finds that the preservation of the records and monuments and remonumentation when necessary is of statewide significance.

Section 2. (Definition.) Unless the language or context clearly indicates that a different meaning is intended, as used in sections 1 to 12, the term "Land surveyor" means any person licensed to practice the art and science of land surveying pursuant to the provisions of Minnesota Statutes, Sections 326.02 to 326.15.

Section 3. (Responsibilities and Duties of the County Board.) Subdivision 1. (Duties Generally.) The county board of each county shall coordinate, administer and supervise the preservation and perpetuation of the monuments and records of the United States public land survey within the county, and where necessary, reestablish the public land survey corners by remonumentation.

Subdivision 2. (Contracts.) The county board may enter into all necessary contracts for the purpose of carrying out the provisions of sections 1 to 12.

Subdivision 3. (Appointment of County Surveyor.) The county board of any county which does not have a county surveyor on June 1, 1978 shall appoint a county surveyor as provided in Minnesota Statutes, Section 389.011, to perform the duties required pursuant to section 1 to 12.

Section 4. (Duties of County Surveyor in Remonumentation Program.) Under the direction of the county board, the county surveyor, or a land surveyor designated by the county board, shall coordinate, supervise, and administer the following functions, duties, and responsibilities:

1. Resurrect, monument and perpetuate the land survey monuments, section corners, quarter section corners, meander corners, and witness corners, or other corners established by the United State public land survey within Minnesota, and preserve all pertinent field notes, plats and documents;

2. Cause a standard monument, as determined by the Minnesota state board of architecture, engineering, land surveying and landscape architecture, to be placed at established public land survey corner sites where practical permanently indicating Minnesota public land survey corners. If such monuments cannot be placed at the exact corner point, then witness corners of similar design shall be placed as close as possible to the true corner;

3. Establish and maintain a safe storage for a comprehensive system of recordation of information, respecting all monuments established by the United States public land survey within this county, and such records as may be pertinent to the establishment or maintenance of land corners, Minnesota coordinate system stations and accessories and monuments in general;

4. Establish and record a state plane coordinate position for each monument of the public land survey when the extended geodetic network base data is available;

5. Provide for township maps where sufficient monuments have been established and tied into the state plane coordinate system and record the coordinate data on the township map along with bearings and distances, and assist in the proper recording of the same by duly constituted public officials;

6. Provide for section mapping for the county showing the monuments established and the bearings and distances, and the state plane coordinate position determined and recorded. These maps shall become a part of the public record and shall be duly recorded by the proper county officials. Property lines of record may be shown on these maps. Geodetic control and monument positions may be shown when available;

7. Collect and preserve information obtained from surveys to establish land monuments or land boundaries. This information shall become a part of the public record and shall be duly recorded by the proper county officials;

8. Furnish upon reasonable request and tender of the required fees therefor, certified copies of records created or maintained by the county. Fees to be charged for certified copies shall be fixed by the county, but shall not exceed the fee authorized in Minnesota Statutes, Section 357.18, for comparable records. All fees collected shall be paid into the county treasury;

9. Prescribe regulations designed to establish uniform professional surveying and mapping methods and minimum standards pursuant to the United States Department of Interior Manual of Instructions for the survey of the Public Lands of the United States, in the county, for the purposes of sections 1 to 12; and

10. Submit a report to the county board and to the review committee established pursuant to section 12 by November 15 each year. The report shall be in sufficient detail to allow the county board and the review committee to determine whether the county surveyor has complied with minimum standards imposed by sections 1 to 12.

Section 5. (Entry Upon Private Property; Damages.) Any county surveyor, geodetic surveyor and any land surveyor designated by a county pursuant to a contract with the county board, may lawfully enter upon private property for the purpose of making surveys, or for searching for or relocating or remonumenting land monuments, stations or section corners, provided the owner or occupant of the property is notified in advance of the intended entry. Reasonable care shall be taken to prevent unnecessary damage to the property should any of these persons necessarily damage the property of the owner in making surveys, searches, or remonumentations. The county board may make reasonable payment for the damage. Members of the board and its employees and contractors of the board are personally liable for any damage caused by their wantonness, willfulness, or negligence.

Section 6. (Certain Records to be Furnished Upon Written Request of the County Surveyor.) All state departments and agencies, county recorders and other officials of county and city governments, including district court judges, shall furnish the county surveyor certified copies of deeds, mortgages and other documents and instruments pertaining to land descriptions which are in their custody. Whenever practicable, the copy shall be furnished without cost; but, in no event shall the cost exceed the actual cost of reproduction. On the same basis of cost, the county surveyor upon request therefore, shall furnish certified copies of records in his custody to state departments and agencies and county and city officers.

Section 7. (Furnishing Information to County Recorder.) When a private surveyor or person performing a survey for a public agency locates an unmarked government corner, he shall submit information relating to the location of the corner to the recorder of the county in which the corner is located. If the surveyor places the standard monument at the site of the corner, he shall receive reimbursement from the county's land survey account for the reasonable costs he incurs in placing the monument.

Section 8. (Establishment of Government Corners Upon Request.) When a private surveyor or a person performing a survey for a public agency has need for the establishment of a government corner to perform a survey, he shall make written request to the county board of the county in which the corner will be located, asking that the county establish the corner. If the county board has not complied with the request within one year after its receipt, the person or agency making the request may reestablish the corner and shall be reimbursed for the reasonable cost of the services by the county board, out of the county's land survey account proceeds.

Section 9. (Contracts.) The county board may enter into contracts for the performance of any of the functions, responsibilities and duties enumerated in section 4, provided the land surveyor in responsible control of the monumentation program is licensed as a land surveyor by the state board of architecture, engineering, land surveying and landscape architecture.

Section 10. (Certificate of Location of Government Corner.) Subdivision 1. A certificate of location of a government corner shall conform to Minnesota Statutes, Section 160.15, Subdivisions 4 and 5.

Subdivision 2. A government corner is not reestablished until a certificate of location of government corner has been filed with the county recorder. The certificate shall be signed by a land surveyor.

Section 11. (Geodetic Control Monuments.) The commissioner of transportation shall establish and maintain a primary network of geodetic control monuments at approximately six mile intervals throughout the state pursuant to N.G.S. standards. He shall set priorities and develop a schedule for geodetic work in order to complete the establishment of geodetic control monuments by July 1, 1988. The commissioner shall advise the counties of the priorities and work schedule so that they may integrate their county land surveys with the state geodetic work.

Section 12. (Review Committee.) Subdivision 1. The commissioner of transportation shall appoint a committee of three land surveyors from each of the department of transportation's districts. One land surveyor shall be employees of the department of transportation and two land surveyors shall not be associated with any state agency. The committee shall review the land survey programs of the counties operating under the provisions of sections 1 to 12. Costs for this committee shall be taken from funds provided in section 17, subdivision 1, clause (a).

Subdivision 2. If the review committee finds that a county's land survey program or its execution of its program is in violation of minimum standards it may recommend that the commissioner of transportation require the county to correct the alleged violations.

If the corrections are not made, the commissioner of transportation shall notify the commissioner of revenue to cancel the next annual payments due that county for its land survey account. The amount cancelled shall be added to the remainder of the account for distribution to other counties. After having been so expelled from this program, the county may correct its program's violations at its expense and reapply for funding a land survey program.

Section 13. Minnesota Statutes 1976, Section 287.21, Subdivision 2, is amended to read:

Subdivision 2. The proceeds of the taxes levied and collected under sections 287.21 to 287.36 shall be credited to the land survey account.

Section 14. Minnesota Statutes 1976, Section 287.25, is amended to read:

287.25 (Payment of Tax; Stamps.) The tax imposed by section 287.21 shall be paid by the affixing of a documentary stamp or stamps in the amount of the tax to the document or instrument with respect to which the tax is paid, provided that the commissioner of revenue may, in exceptional cases, permit the payment of the tax without the affixing of the documentary stamps and in such cases shall, upon receipt of the tax, endorse his receipt for such tax upon the face of the document or instrument. In such case the commissioner of revenue shall deposit the amount received in payment of the tax with the state treasurer to the credit of the land survey account.

Section 15. Minnesota Statutes 1976, Section 287.28, is amended to read:

287.28 (Refundments or Redemption.) The commissioner of revenue may order the refundment in whole or in part of any tax which has been erroneously or unjustly paid and may allow for or redeem such of the stamps, issued under the authority of sections 287.21 to 287.36 as may have been spoiled, destroyed, or rendered useless or unfit for the purpose intended or for which the owner may have no use or which through mistake may have been improperly or unnecessarily used. Such order shall be made only upon written application of the taxpayer and shall, if the refundment exceeds $500, be valid only if approved by the attorney general. Refunds therefore shall be paid out of the land survey account of the state and moneys therefore are hereby annually appropriated from the land survey account for such purpose.

Sec. 16. Minnesota Statutes 1976, Section 287.29, Subdivision 1, is amended to read:

287.29 (Payment of Receipts to State; Report; Record.) Subdivision 1. On or before the tenth day of each month the county

treasurer shall determine and pay to the state treasurer the receipts from the sale of documentary stamps during the preceding month. The state treasurer shall deposit such receipts in the state treasury to the credit of land survey account.

Section 17. (287.37) (Distribution of Proceeds.) Subdivision 1. By November 1 of each year the commissioner of revenue shall determine the amount of the deed tax imposed by section 287.21 that has been paid to the state treasurer from each county during the fiscal year ending the preceding June 30, less the refunds made by the commissioner applicable to each county during the same fiscal year. From the remainder the commissioner shall make payments as follows:

a. $100,000 to the trunk highway fund, from which the same amount is appropriated to the commissioner of transportation to be used exclusively to provide minimum standards to guide the execution by each county participating in the land survey program required by sections 1 to 12;

b. to the trunk highway fund according to the following schedule for establishing geodetic control monuments: first year - $230,000, second year - $440,000, third year - $640,000, fourth year and thereafter - $570,000 from which the same amount is appropriated to the commissioner of transportation for the addition of 22 (expires 1988) positions over the department's approved complement limit;

c. $40,000 to each county, plus one cent for each acre of land within that county;

d. the balance, if any, apportioned among the counties according to the proportion of the remainder contributed from each county.

Subdivision 2. Money paid to a county pursuant to this section shall be used only for the land survey required by sections 1 to 12 until the survey is completed. The county board, with the approval of the commissioner of transportation, shall certify completion to the commissioner of revenue. Subsequent annual payments to the county shall be one-half the amount that would otherwise be due the county, and the other half shall cancel to the general fund of the state. After a county land survey has been certified as complete, the county may use money paid to it pursuant to this section for any lawful county purpose.

Subdivision 3. The amount necessary to make payments pursuant to this section is annually appropriated from the land survey account to the commissioner of revenue.

Section 18. Minnesota Statutes 1976, Section 389.011, Subdivision 2, is amended to read:

Subdivision 2. (Election, Term, Appointment.)

1. The board of county commissioners may by resolution duly adopted at least six months before the end of the term of the office of county surveyor declare its intention to fill the office by appointment. Having adopted such a resolution the board of county commissioners shall fill the office of county surveyor by appointment of a land surveyor to the office not less than 30 days before the end of the term of office of the incumbent. When so appointed the county surveyor shall serve for such term as determined by the board commencing upon the expiration of the term of the incumbent but not to exceed four years.

2. In any county wherein the office of county surveyor has not been made appointive under the provisions of this section, there shall be elected a county surveyor in the manner provided by law. The term of office of the county surveyor shall be four years and until his successor is elected and qualified, and begin on the first day of January next succeeding his election.

3. If the office of county surveyor is vacant by reason of no qualified person having been elected to the office or the board of county commissioners having failed to appoint a person to the office or is otherwise vacant and there are duties which prior to January 1, 1961, had been the responsibility of the county surveyor the officer requiring such duties to be performed may retain a land surveyor to perform such duties at the compensation set by the county board.

APPENDIX F

MISCELLANEOUS INFORMATION

Federal Grants - School Lands

1. 2,969,990 acres (sections 16 and 36) were set aside for school purposes in the Minnesota Enabling Act [26 February 1857; ch. 60; 11 Stat. 166].

2. 82,640 acres (as of 1882) were granted to Minnesota for universities. 120,000 acres were granted to the University of Minnesota under the Agricultural And Mechanical College Act.

Military Bounty Grants

2,760 acres of land had been distributed to persons holding military bounty land warrants as of 30 June 1882.

Indian Reservations

As of 30 June 1882, the following Indian Reservations existed in Minnesota:

1. Boise Forte - 107,509 acres.
2. Fond du Lac - 100,121 acres.
3. Grand Portage (Pigeon River) - 51,840 acres.
4. Leech Lake - 94,440 acres.
5. Mille Lac - 61,014 acres.
6. Red Lake - 3,200,000 acres.
7. Vermillion Lake - 1,080 acres.
8. White Earth - 796,672 acres.
9. Winnebagoshish - 320,000 acres.
10. Deer Creek - 23,040 acres.

Railroad Grants And Internal Improvement Grants

Minnesota received 500,000 acres of land for internal improvements. The following is a partial list of grants to railroads:

1. First Div. St. Paul & Pacific: 1857, 1865, 1871.
2. Western R.R. (formerly B.B. St. P.P.): 1857, 1865.
3. Minnesota Central: 1857, 1865.
4. Winona & St. Peter: 1857, 1865.
5. St. Paul & Sioux City: 1857, 1863.
6. Lake Superior & Mississippi: 1863.
7. Southern Minnesota: 1866.
8. Hastings & Dakota: 1866.

Town Sites
Act of 23 May 1844

The following is a list of the town sites and the acerages granted by the Federal Government in Minnesota:

1. Onoeta - 320 acres
2. Shelbyville - 80 acres
3. Le Sueur - 120 acres
4. Le Sueur City - 280 acres
5. Belle Prarie - 246.4 acres
6. Elk City - 297.3 acres
7. St. Joseph - 160 acres
8. St. Cloud - 176.77 acres
9. Maple Lake - 197.28 acres
10. Red Stone - 320 acres
11. Young America - 172.4 acres
12. New Ulm - 314.4 acres
13. Fremont City - 200 acres
14. Arlington - 120 acres
15. Mazeppa - 320 acres
16. Cannon City - 312.25 acres
17. Cold Springs City - 320 acres
18. St. Clair - 320 acres
19. Traverse - 320 acres
20. Harrisburg - 40 acres
21. Chasea - 264.89 acres
22. Oronoco - 320 acres
23. Minneiska - 289.15 acres
24. Monticello - 267.72 acres
25. Winona - 217.4 acres
26. Rockville - 400 acres
27. Saint Lawrence - 166.4 acres
28. Saint Charles - 120 acres
29. Rome - 284.5 acres

County Seat Grant
Act of 26 May 1824

Sibley County received a grant of 160 acres from the Federal Government to build a courthouse.

Homestead Entries
20 May 1862 to 30 June 1882

Year (30 June)	No.	Acreage	Year (30 June)	No.	Acreage
1863	2299	277,526.45	1873	3299	357,473.31
1864	3258	428,487.79	1874	2959	299,730.22

Year (30 June)	No.	Acreage	Year (30 June)	No.	Acreage
1865	3972	531,707.89	1875	2463	229,835.44
1866	3789	497,379.77	1876	2664	267,437.62
1867	2985	363,934.78	1877	1678	183,881.33
1868	2946	358,241.78	1878	4986	592,724.52
1869	3389	365,660.99	1879	5669	648,221.88
1870	3025	334,792.78	1880	5191	687,906.67
1871	3899	461,639.56	1881	3993	538,676.32
1872	3908	459,456.18	1882	4244	588,343.61

As of 30 June 1882, there were 70,616 original entries encompassing 8,473,058.89 acres of land, and final entries of 31,610 encompassing 3,672,710.61 acres. As of 30 June 1882, there were 11,149 entries encompassing 1,633,132.95 acres of land under the Timber Culture Act of 3 March 1873.

Swamp Land Grants

As of 30 June 1883, Minnesota claimed 4,109,887.49 acres of swamp and over flow lands; 2,448,980.00 acres were approved by Congress; and 2,271,967.24 acres had been patented to Minnesota. The selection of swamp and over flow lands in Minnesota was made by the Surveyor General or the General Land Office from the field notes of the survey.

Miscellaneous Readings

Below is a list of some articles relating to the surveys in Minnesota compiled from various sources. This list is quite incomplete.

1. *Proceedings Of The Minnesota Engineering And Surveying Society.*
    1. Anderson, O.J. "A County Surveyor's Records"; vol. 2; pp. 20 - 25; 1897.
    2. Anderson, O.J. "Restoring And Perpetuating Corners Of The United States Government Survey"; vol. 5; pp. 41 - 45; 1900.
    3. Armstrong, J.H. "The Restoration Of Lost Corners"; vol. 1; pp. 33 - 38; 1896.

4. Butler, Nathan "Old Time Surveyors"; vol. 18; pp. 133 - 137; 1913.
5. Cooley, George W. "Proper Methods Of Conducting A County Surveyor's Office"; vol. 6; pp. 80 - 86; 1901.
6. Forbes, Charles A. "The Progress Of The Century"; vol. 6; pp. 68 - 69; 1901.
7. Forbes, Charles A. "The Evaluation Of The County Surveyor"; vol. 3; pp. 105 - 116; 1898.
8. Fraser, William C. "Laws Affecting Corners And Boundary Lines"; vol. 8; pp. 73 - 81; 1905.
9. Kennedy, S.L. "Obliterated Corners And Court Decisions"; vol. 18; pp. 128 - 132; 1913.
10. Knudson, Louis "The Office Of County Surveyor"; vol. 19; pp. 15 - 16; 1914.
11. Mavity, J.W. "The County Surveyor - Engineer"; vol. 19; pp. 17 - 20; 1914.
12. ——— "Digest Of Minnesota Supreme Court Decisions"; vol. 11; pp. 66 - 73; 1906.
13. Moyer, Sumner L. "The Laws Relating To Surveyors"; vol. 8; pp. 69 - 70; 1905.
14. Mullen, S.F. "The County Surveyor"; vol. 6; pp. 86 - 89; 1901.
15. Reynolds, James "Resurveys In Cities And Villages"; vol. 20; pp. 91 - 94; 1915.

2. *Minnesota Historical Society Collections.*

1. Butler, Nathan "Boundaries And Public Land Surveys Of Minnesota"; vol. XII; pp. 649 - 670; 1908.
2. Simpson, Thomas "The Early Land Surveys In Minnesota, West Of The Mississippi"; vol. X, part 1; pp. 57 - 67; 1905.
3. Iverson, Samuel G. "The Public Lands And School Fund Of Minnesota"; vol. XV; pp. 287 - 314; 1915.
4. Culkin, William E. "Northern Minnesota Boundary Surveys In 1822 To 1826 Under The Treaty Of Ghent"; vol. XV; pp. 379 - 392; 1915.
5. ——— "A Memorial To William Drew Washburn, 1831 - 1912, Surveyor General Of Minnesota, 1861 - 1865"; vol. XV; p. 816; 1915.
6. ——— "A Memorial To Newton Horace Winchell, 1839 - 1914, State Geologist Of Minnesota"; vol. XV; pp. 824 - 830; 1915.
7. Walker, Thomas "Memories Of Early Life And Development Of Minnesota" (discussion of surveys); vol. XV; pp. 463 - 466; 1915.
8. Saby, Rasmus S. "Railroad Legislation In Minnesota, 1849 - 1875"; vol. XV; pp. 1 - 188; 1915.

3. Miscellaneous.

1. Orfield, Matthias Nordberg "Federal Land Grants To The States"; *Studies In Social Science*; (University of Minnesota Press: No. 2, 1915).
2. ——— *Public Lands Bibliography*; Bureau of Land Management; (Washington: Government Printing Office; 1963).

Note: The statistics presented in this Appendix are from: *The Public Domain, Its History, With Statistics, With References To The National Domain, Colonization, Acquirement Of Territory, The Survey, Administration And Several Methods Of Sale And Disposition Of The Public Domain Of The United States, With Sketch Of Legislative History Of The Land States And Territories, And References To The Land System Of The Colonies, And Also That Of Several Foreign Governments*; by Thomas Donaldson; (Washington: Government Printing Office; 1884).