☞05hr_SSC-DNRRR_Misc_pt06i

☞ **Exhibits/comments submitted by Tilton. RE: DNR study regarding Lower St. Croix ordinary high water mark.**

(FORM UPDATED: 08/11/2010)

WISCONSIN STATE LEGISLATURE ...
PUBLIC HEARING - COMMITTEE RECORDS

2005-06

(session year)

Senate Select

(Assembly, Senate or Joint)

Committee on ... DNR (SSC-DNRRR)

COMMITTEE NOTICES ...

- Committee Reports ... **CR**
- Executive Sessions ... **ES**
- Public Hearings ... **PH**

INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt** (w/Record of Comm. Proceedings)
- Clearinghouse Rules ... **CRule** (w/Record of Comm. Proceedings)
- Hearing Records ... bills and resolutions (w/Record of Comm. Proceedings)
  (**ab** = Assembly Bill) (**ar** = Assembly Resolution) (**ajr** = Assembly Joint Resolution)
  (**sb** = Senate Bill) (**sr** = Senate Resolution) (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

* Contents organized for archiving by: Mike Barman (LRB) (July/2012)

FLOODED AREA OF AFTON, MINNESOTA

Prepared by

DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

for

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

1971

FLOODED AREA OF AFTON, MINNESOTA

By Lowell C. Guetzkow

This study of Afton, Minn., was made at the request of the Federal Insurance Administration of the Department of Housing and Urban Development by the U.S. Geological Survey. Financing was provided under an interagency agreement by the Department of Housing and Urban Development.

Afton is located on the St. Croix River in Washington County, Minnesota. Afton was first developed on the flood plain of the St. Croix River and later expanded to include the remaining unincorporated part of Afton Township. Although much of the St. Croix River is bordered by steep bluffs, the bluff line is broken at Afton by a small tributary, Valley Branch, which drains much of the village. The area of Afton above the bluff is characterized by steep slopes along Valley Branch and Trout Brook, and by more level areas where surface drainage is into potholes and lakes which have no natural outlet.

Large areas of Afton remain to be developed. The village lies just south of the interstate highway and it is included in the Twin City metropolitan area. It is a prime area for development owing to its nearness to the major population centers, availability of lake-type recreational

activities afforded by the St. Croix River, and scenic areas for residential construction. Urbanization of the undeveloped areas is likely to be fairly rapid in the future.

The St. Croix River empties into the Mississippi River 9 miles downstream from the study area. The river in this area is very wide and deep and is known locally as Lake St. Croix because of its lakelike characteristics. The lower St. Croix River is in the navigation pool formed by the U.S. Corps of Engineers Lock and Dam 3, on the Mississippi River near Red Wing, Minn. During periods of low flow, therefore, the level of the St. Croix River is maintained at or near a normal pool elevation of 675 feet above mean sea level. During periods of high flow, the gates at Lock and Dam 3 are raised, and the effect of the dam on flood flows is negligible.

The flood plain of Valley Branch is very wide at the mouth and is only a few feet above the normal pool elevation of the St. Croix River. Therefore, flooding in the lower part of Valley Branch is primarily the result of backwater from the St. Croix River.

From the above discussion the flood problems in Afton can logically be separated into three areas: those areas subject to inundation by the St. Croix River; areas within the flood plain of steeply sloping streams, principally Valley Branch; and, those areas adjacent to and subject to inundation from runoff accumulating in lakes and potholes.

This study has been limited to those areas having the greatest flood damage potential and for those areas where local planners have indicated the need for implementation of flood-plain management practices. The flood-plain areas studied for this report are those along the St. Croix River and the lower reaches of Valley Branch and South Fork Valley Branch.

An analysis of the flood characteristics of the lower St. Croix River necessarily involves a study of the peak flows on the Mississippi River at Prescott, Wis. Prescott is located at the confluence of the Mississippi and St. Croix Rivers, where streamflow records have been collected by the Geological Survey since 1928. The lower St. Croix River channel has a large capacity to carry flood flows generated from its own watershed. Foreseeable urbanization in the watershed will not significantly affect flood flows of the St. Croix River. The major flood problem stems from the backwater effect from the Mississippi River. This can be illustrated by the fact that the largest flood of record (1902-71) on the upper St. Croix River resulted in only the fifth highest flood (in terms of elevation) on the lower St. Croix River.

The highest flood elevation recorded at Afton occurred during April 1965, when the flood stage reached 693.0 feet above mean sea level, datum of 1929. At its peak, the St. Croix River contributed 19 percent of the flow in the

Mississippi River immediately downstream from Prescott.

A flood-frequency analysis of the gaging station records for the Mississippi River at Prescott, Wis., was made in accordance with the recommendations of the Water Resources Council Bulletin 15. This analysis indicated that a good fit to the data could be obtained through use of a log-normal distribution. The discharge of 218,000 cubic feet per second at the 100-year recurrence interval, as determined by the Geological Survey, is in close agreement with a Corps of Engineers analysis, which was used to develop a 100-year flood profile for the Mississippi River. This profile has been adopted as the regional (100-year) flood by the Wisconsin and Minnesota Departments of Natural Resources.

At the peak flow of 218,000 cubic feet per second, the stage-discharge-relation curve for the Geological Survey gaging station at Prescott indicates an elevation of 692.0 feet above mean sea level, datum of 1929.

From this established profile point at the confluence of the Mississippi and St. Croix Rivers, the 100-year flood profile was extended up the St. Croix River, based on a comparison with historic profiles. Slopes are extremely flat through this reach, which greatly minimizes errors in shaping the profile. This profile represents the regional flood, as defined by the "Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota." By a similar analysis, a profile was developed for the 500-year

flood, as shown on the accompanying figure "Flood Frequency Profiles of St. Croix River at Afton, Minnesota."

Profile elevations for the 100-year flood range from 692.5 feet above mean sea level, datum of 1929, at the north city limits to 692.3 feet at the south city limits. The 1965 flood stage on the St. Croix River was approximately half a foot higher through the study reach.

Valley Branch is an ungaged small stream which necessitated a flood-frequency analysis based upon records from similar watersheds and use of regionalization techniques. In addition, consideration was given to the effect of development on peak flows. From the analysis, the required flood-frequency discharges were determined for appropriate points along the stream within the study reach. The 100-year flood discharges for the Valley Branch watershed are as follows:

Valley Branch at mouth	4,500 cfs
Valley Branch above South Fork	1,800 cfs
Valley Branch above tributary entering at cross-section 57	200 cfs
South Fork Valley Branch	4,000 cfs

No historical flood-profile data existed for Valley Branch. Therefore, it was necessary to produce theoretical profiles which were obtained from a digital computer model utilizing a step-backwater program. A total of 65 cross-sections along Valley Branch and South Fork of Valley Branch

were used in the step-backwater computations. These sections were located so as to evaluate normal channel losses and the effects of man-made structures, such as dams, roadways, bridges, etc., located within the flood plain. Profiles for the 100-year and 500-year floods are shown on the accompanying figures "Flood Frequency Profiles of Valley Branch at Afton, Minnesota" and "Flood Frequency Profiles of South Fork Valley Branch at Afton, Minnesota."

Using the 100-year and 500-year flood elevations derived from the profiles, the outlines for the respective floods were transferred by photogrammetric techniques to maps prepared for the study. The areas that would be inundated are shown on the three maps titled, "Flooded Area Map of Afton, Minnesota."

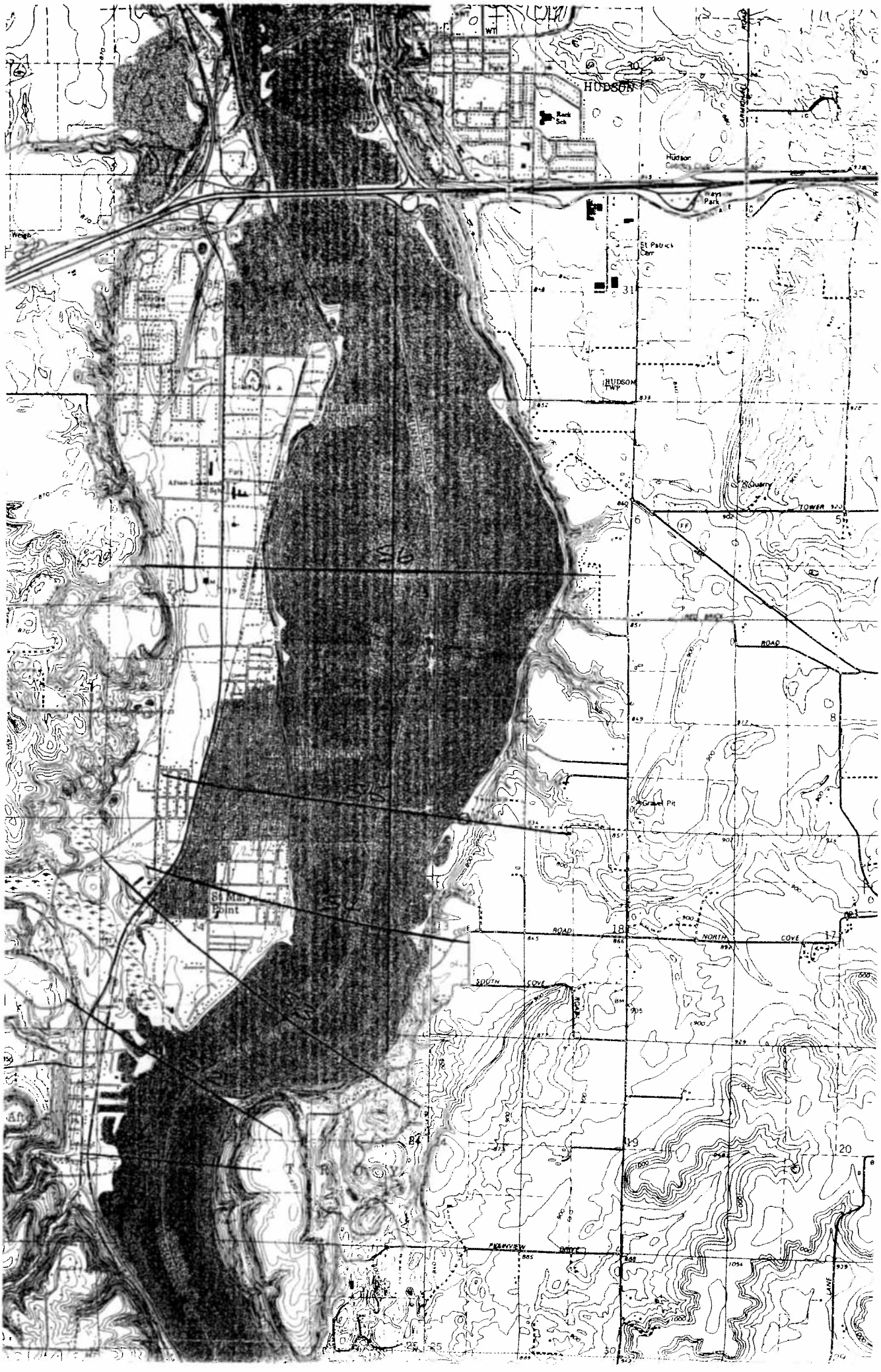
An emergency dike was constructed by the Corps of Engineers along the St. Croix River adjacent to the railroad. The dike was not intended as a permanent structure and is not certified by the Corps of Engineers as being adequate. Therefore, inundated areas have been outlined disregarding the existing dike.

Representative cross sections were obtained in the St. Croix River through the study reach. These cross sections indicate that the conveyance of the main channel is so large, with respect to the overbank conveyance at the elevation corresponding to the 100-year flood, that complete on-land encroachment would cause less than 0.1 foot of backwater.

The on-land conveyance is considerably less than one percent of the total conveyance at the 100-year flood level. Therefore, floodway limits along the St. Croix River could be drawn at the natural shoreline (normal pool elevation, 675 feet above sea level) with no significant backwater effect.

River miles, as used in this study, were taken from "Upper Mississippi River Navigation Charts, 1968," which are available from the St. Paul District, Corps of Engineers.

000403


HUDSON
St Patrick Cem
HUDSON TWP
TOWER
ROAD
Gravel Pit
St Mary's Point
NORTH COVE
SOUTH COVE
PARKVIEW DRIVE
LANE

000405

HEC-RAS River: St. Croix Reach: Hudson to Afton

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hudson to Afton	1	100-yr	Ppsd Conds	61000.00	605.00	691.50	611.88	691.50	0.000001	0.42	146974.10	3495.50	0.01
Hudson to Afton	1	100-yr	Eff FW	61000.00	605.00	691.50	611.88	691.50	0.000001	0.42	146974.10	3495.50	0.01
Hudson to Afton	1	100-yr FW	Ppsd Conds	61000.00	605.00	691.50	611.88	691.50	0.000001	0.42	144795.00	2830.00	0.01
Hudson to Afton	1	100-yr FW	Eff FW	61000.00	605.00	691.50	611.88	691.50	0.000001	0.42	144795.00	2830.00	0.01
Hudson to Afton	2	100-yr	Ppsd Conds	61000.00	655.00	691.49		691.51	0.000018	1.13	66204.25	3902.30	0.04
Hudson to Afton	2	100-yr	Eff FW	61000.00	655.00	691.49		691.51	0.000018	1.13	66204.25	3902.30	0.04
Hudson to Afton	2	100-yr FW	Ppsd Conds	61000.00	655.00	691.49		691.51	0.000018	1.14	62787.38	3330.00	0.04
Hudson to Afton	2	100-yr FW	Eff FW	61000.00	655.00	691.49		691.51	0.000018	1.14	62787.38	3330.00	0.04
Hudson to Afton	3	100-yr	Ppsd Conds	61000.00	630.00	691.52		691.52	0.000001	0.32	196746.30	7419.10	0.01
Hudson to Afton	3	100-yr	Eff FW	61000.00	630.00	691.52		691.52	0.000001	0.32	196746.30	7419.10	0.01
Hudson to Afton	3	100-yr FW	Ppsd Conds	61000.00	630.00	691.52		691.52	0.000001	0.32	192117.10	3900.00	0.01
Hudson to Afton	3	100-yr FW	Eff FW	61000.00	630.00	691.52		691.52	0.000001	0.32	192117.10	3900.00	0.01
Hudson to Afton	4	100-yr	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000001	0.39	163049.90	4697.10	0.01
Hudson to Afton	4	100-yr	Eff FW	61000.00	625.00	691.52		691.52	0.000001	0.39	163049.90	4697.10	0.01
Hudson to Afton	4	100-yr FW	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000001	0.39	157715.20	2875.00	0.01
Hudson to Afton	4	100-yr FW	Eff FW	61000.00	625.00	691.52		691.52	0.000001	0.39	157715.20	2875.00	0.01
Hudson to Afton	5	100-yr	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000000	0.27	226412.30	4576.46	0.01
Hudson to Afton	5	100-yr	Eff FW	61000.00	625.00	691.52		691.52	0.000000	0.27	227439.00	4584.89	0.01
Hudson to Afton	5	100-yr FW	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000000	0.27	225697.90	4150.00	0.01
Hudson to Afton	5	100-yr FW	Eff FW	61000.00	625.00	691.52		691.52	0.000000	0.27	225697.90	4150.00	0.01
Hudson to Afton	6	100-yr	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000000	0.16	377766.90	7469.73	0.00
Hudson to Afton	6	100-yr	Eff FW	61000.00	625.00	691.52		691.52	0.000000	0.16	377766.90	7469.73	0.00
Hudson to Afton	6	100-yr FW	Ppsd Conds	61000.00	625.00	691.52		691.52	0.000000	0.16	377454.70	7415.00	0.00
Hudson to Afton	6	100-yr FW	Eff FW	61000.00	625.00	691.52		691.52	0.000000	0.16	377454.70	7415.00	0.00

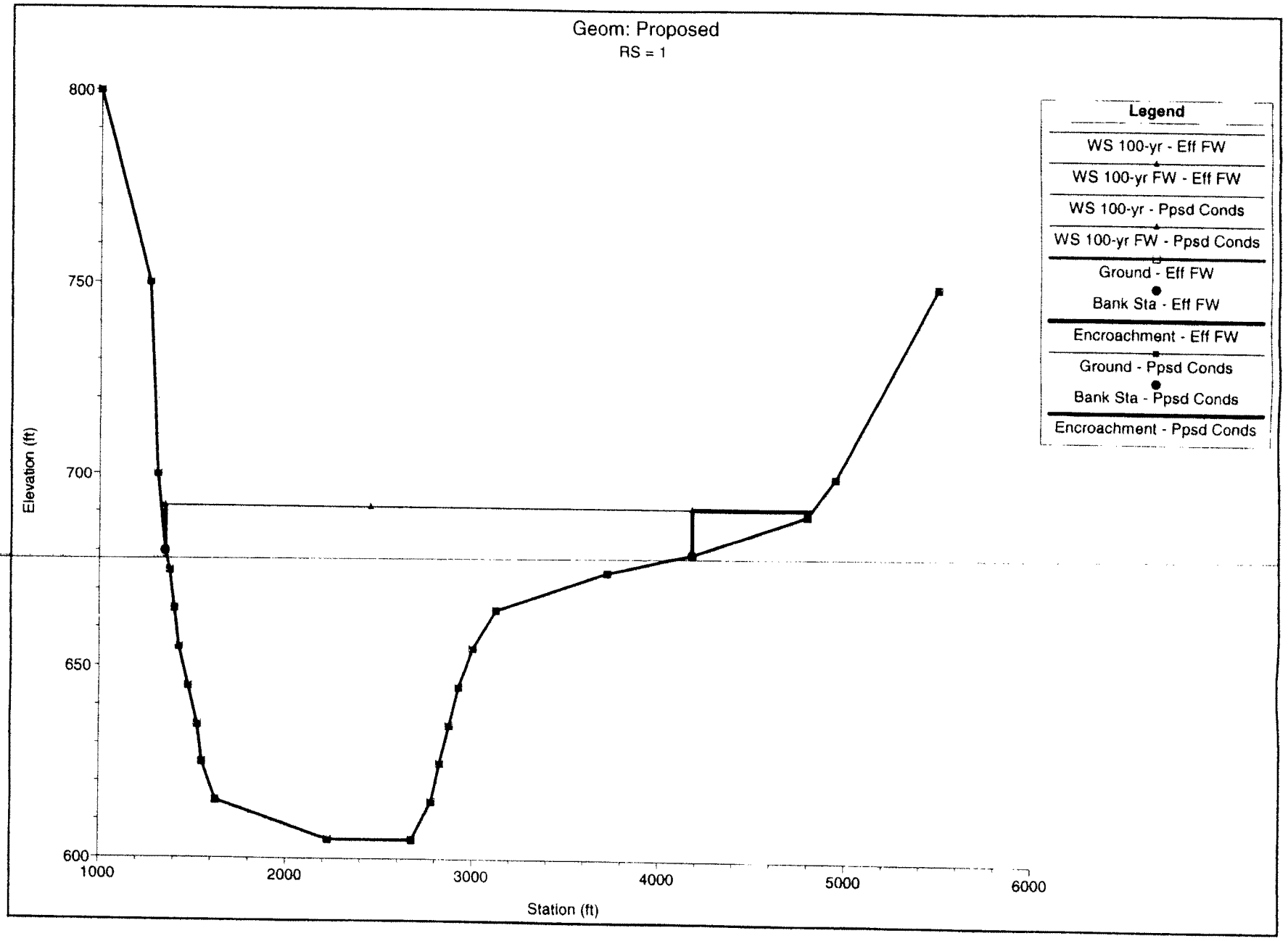
WATER SURFACE ELEVATION

Energy Gradeline elevation (Hydraulic thing)

0004007

HEC-RAS Plan: Eff Nat River: St. Croix Reach: Hudson to Afton

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Hudson to Afton	1	10-yr	39300.00	605.00	686.70	610.34	686.70	0.000000	0.30	132647.50	3258.80	0.01
Hudson to Afton	1	50-yr	53800.00	605.00	689.80	611.40	689.80	0.000001	0.38	143057.30	3457.20	0.01
Hudson to Afton	1	100-yr	61000.00	605.00	691.50	611.88	691.50	0.000001	0.42	148974.10	3495.50	0.01
Hudson to Afton	1	500-yr	77000.00	605.00	694.50	612.84	694.50	0.000001	0.50	159537.10	3546.50	0.01
Hudson to Afton	2	10-yr	39300.00	655.00	686.69		689.71	0.000018	0.96	47971.15	3678.13	0.04
Hudson to Afton	2	50-yr	53800.00	655.00	689.79		689.81	0.000019	1.09	59620.76	3839.29	0.04
Hudson to Afton	2	100-yr	61000.00	655.00	691.49		691.51	0.000018	1.13	66204.25	3902.30	0.04
Hudson to Afton	2	500-yr	77000.00	655.00	694.49		694.52	0.000018	1.23	78068.15	4007.29	0.04
Hudson to Afton	3	10-yr	39300.00	630.00	686.71		686.71	0.000000	0.23	173959.90	4074.50	0.01
Hudson to Afton	3	50-yr	53800.00	630.00	689.82		689.82	0.000000	0.29	186732.40	4155.20	0.01
Hudson to Afton	3	100-yr	61000.00	630.00	691.52		691.52	0.000001	0.32	198746.30	7419.10	0.01
Hudson to Afton	3	500-yr	77000.00	630.00	694.52		694.52	0.000001	0.37	221058.30	7437.12	0.01
Hudson to Afton	4	10-yr	39300.00	625.00	686.71		686.71	0.000000	0.27	145465.90	3167.46	0.01
Hudson to Afton	4	50-yr	53800.00	625.00	689.82		689.82	0.000001	0.35	155383.00	3221.79	0.01
Hudson to Afton	4	100-yr	61000.00	625.00	691.52		691.52	0.000001	0.39	163049.90	4697.10	0.01
Hudson to Afton	4	500-yr	77000.00	625.00	694.52		694.53	0.000001	0.46	177374.20	4839.79	0.01
Hudson to Afton	5	10-yr	39300.00	625.00	686.71		686.71	0.000000	0.19	206127.80	4315.90	0.00
Hudson to Afton	5	50-yr	53800.00	625.00	689.82		689.82	0.000000	0.25	219767.70	4442.28	0.01
Hudson to Afton	5	100-yr	61000.00	625.00	691.52		691.52	0.000000	0.27	227439.00	4584.89	0.01
Hudson to Afton	5	500-yr	77000.00	625.00	694.53		694.53	0.000000	0.32	241629.50	4859.02	0.01
Hudson to Afton	6	10-yr	39300.00	625.00	686.71		686.71	0.000000	0.11	341907.40	7446.89	0.00
Hudson to Afton	6	50-yr	53800.00	625.00	689.82		689.82	0.000000	0.15	365058.20	7461.65	0.00
Hudson to Afton	6	100-yr	61000.00	625.00	691.52		691.52	0.000000	0.16	377766.90	7469.73	0.00
Hudson to Afton	6	500-yr	77000.00	625.00	694.53		694.53	0.000000	0.19	400239.40	7484.01	0.00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Bank Sta - Eff FW
Encroachment - Eff FW
Ground - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
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750
700
650
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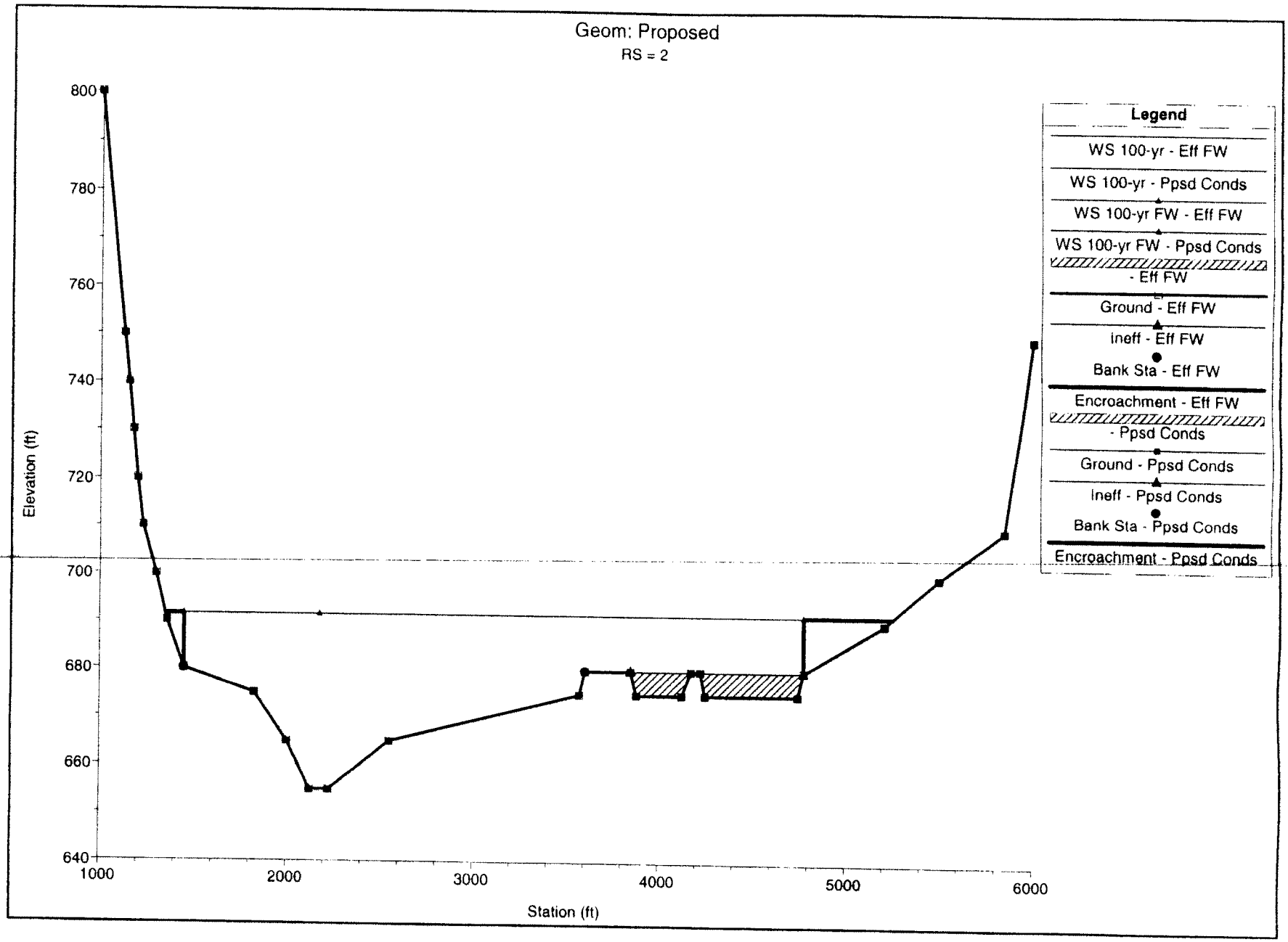
4000
5000
6000
Station (ft)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Ground - Eff FW
Ineff - Eff FW
Bank Sta - Eff FW
Encroachment - Eff FW
- Ppsd Conds
Ground - Ppsd Conds
Ineff - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
Elevation (ft)
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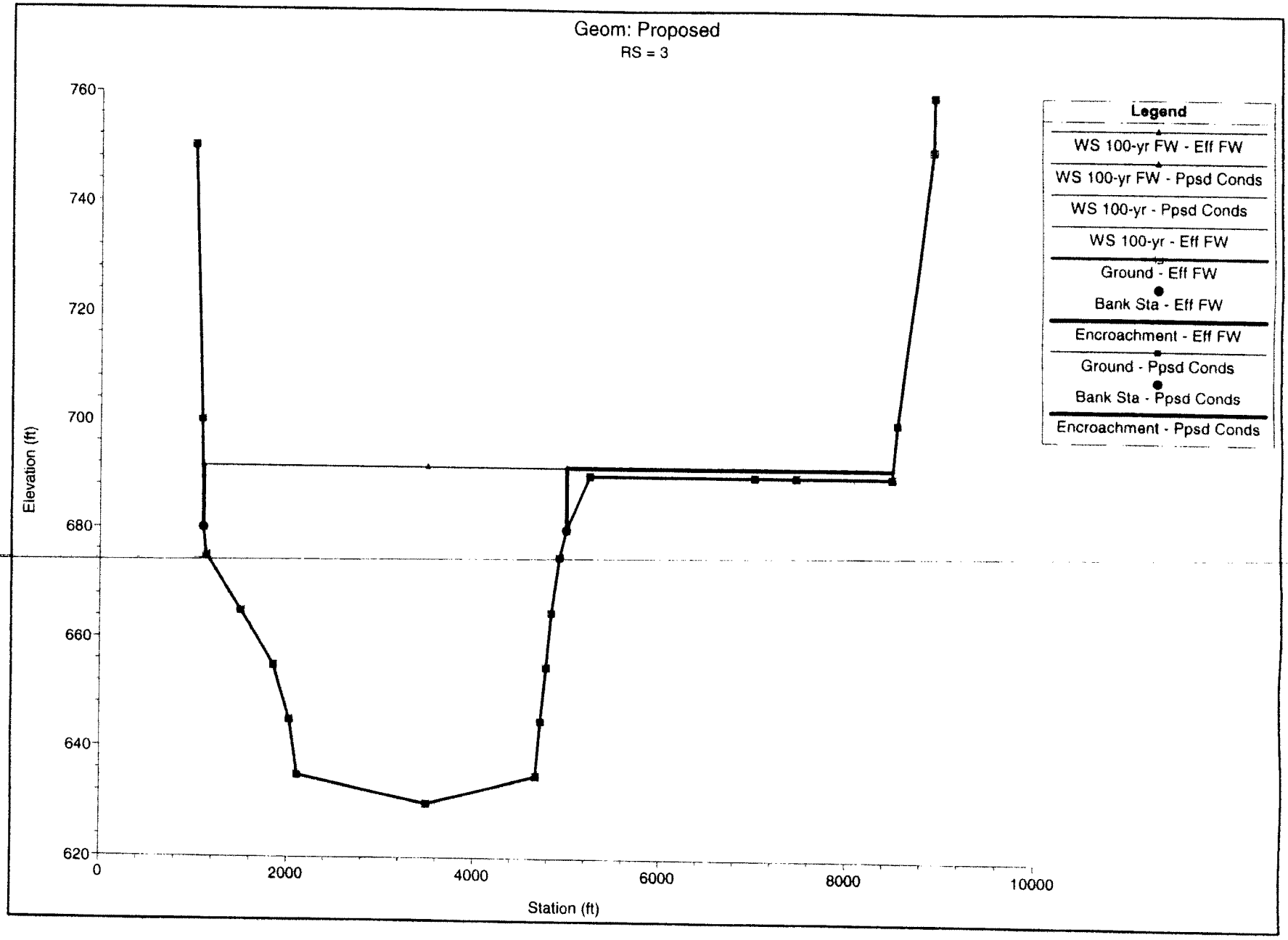
1000
2000
3000
4000
5000
6000
Station (ft)

000410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720
700
680
660
640
620
Elevation (ft)
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2000
4000
6000
8000
10000
Station (ft)
Legend
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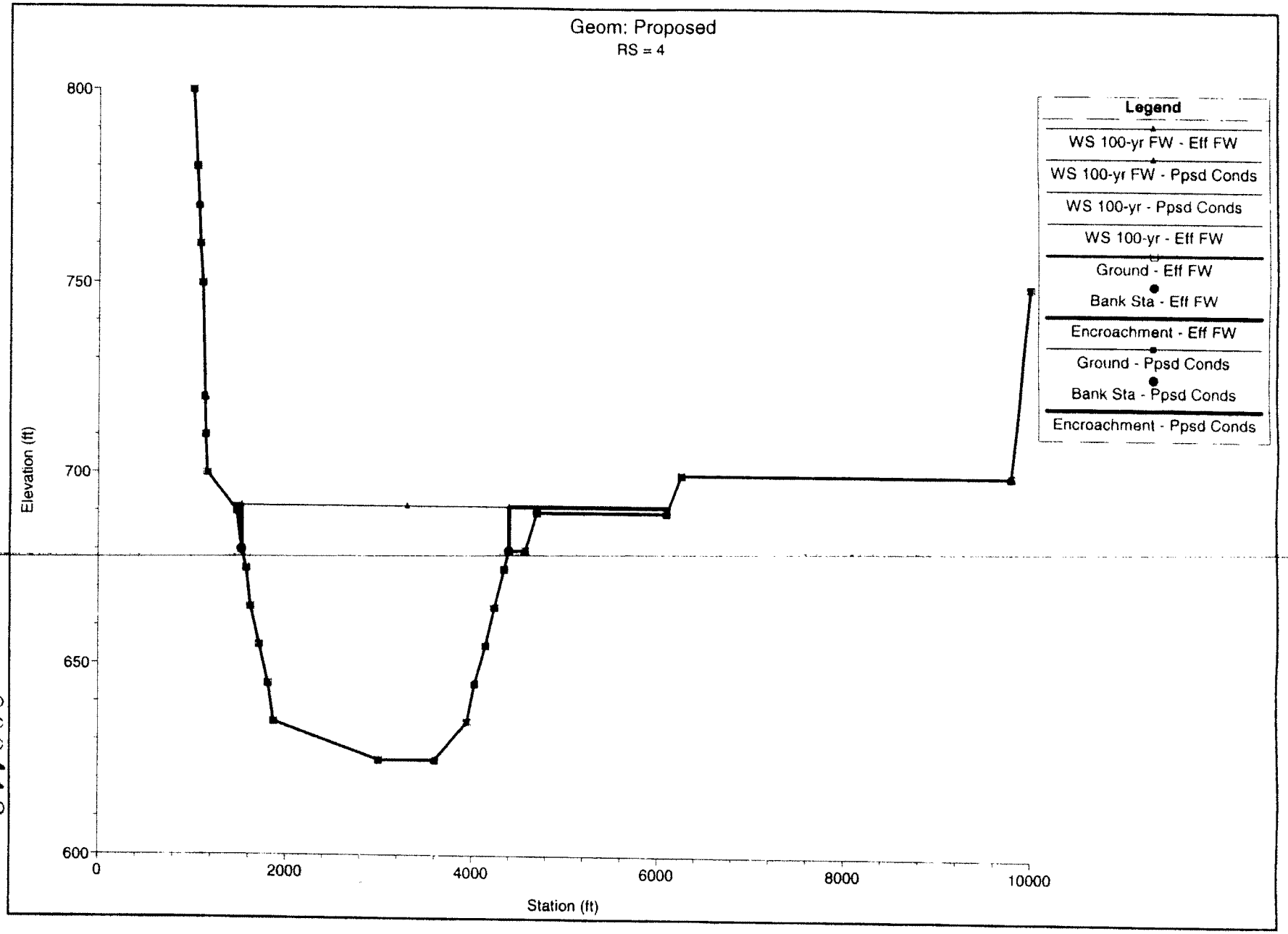
WS 100-yr FW - Ppsd Conds
WS 100-yr - Ppsd Conds
WS 100-yr - Eff FW
Ground - Eff FW
Bank Sta - Eff FW
Encroachment - Eff FW
Ground - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds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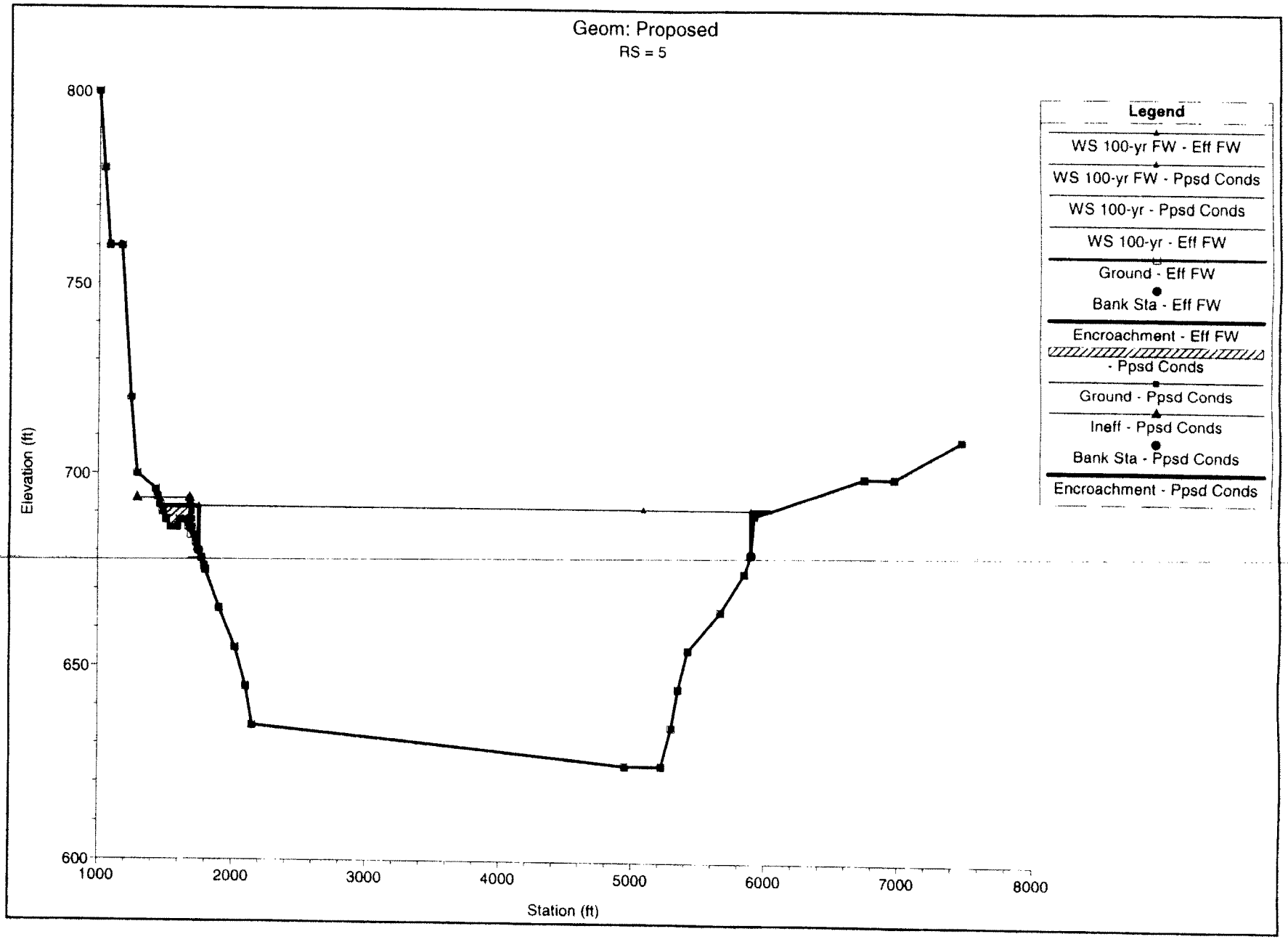
WS 100-yr - Ppsd Conds
WS 100-yr - Eff FW
Ground - Eff FW
Bank Sta - Eff FW
Encroachment - Eff FW
Ground - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
Elevation (ft)
800
750
700
650
600
0
2000
4000
6000
8000
10000
Station (ft)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WS 100-yr - Ppsd Conds
WS 100-yr - Eff FW
Ground - Eff FW
Bank Sta - Eff FW
Encroachment - Eff FW
- Ppsd Conds
Ground - Ppsd Conds
Ineff - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
Elevation (ft)
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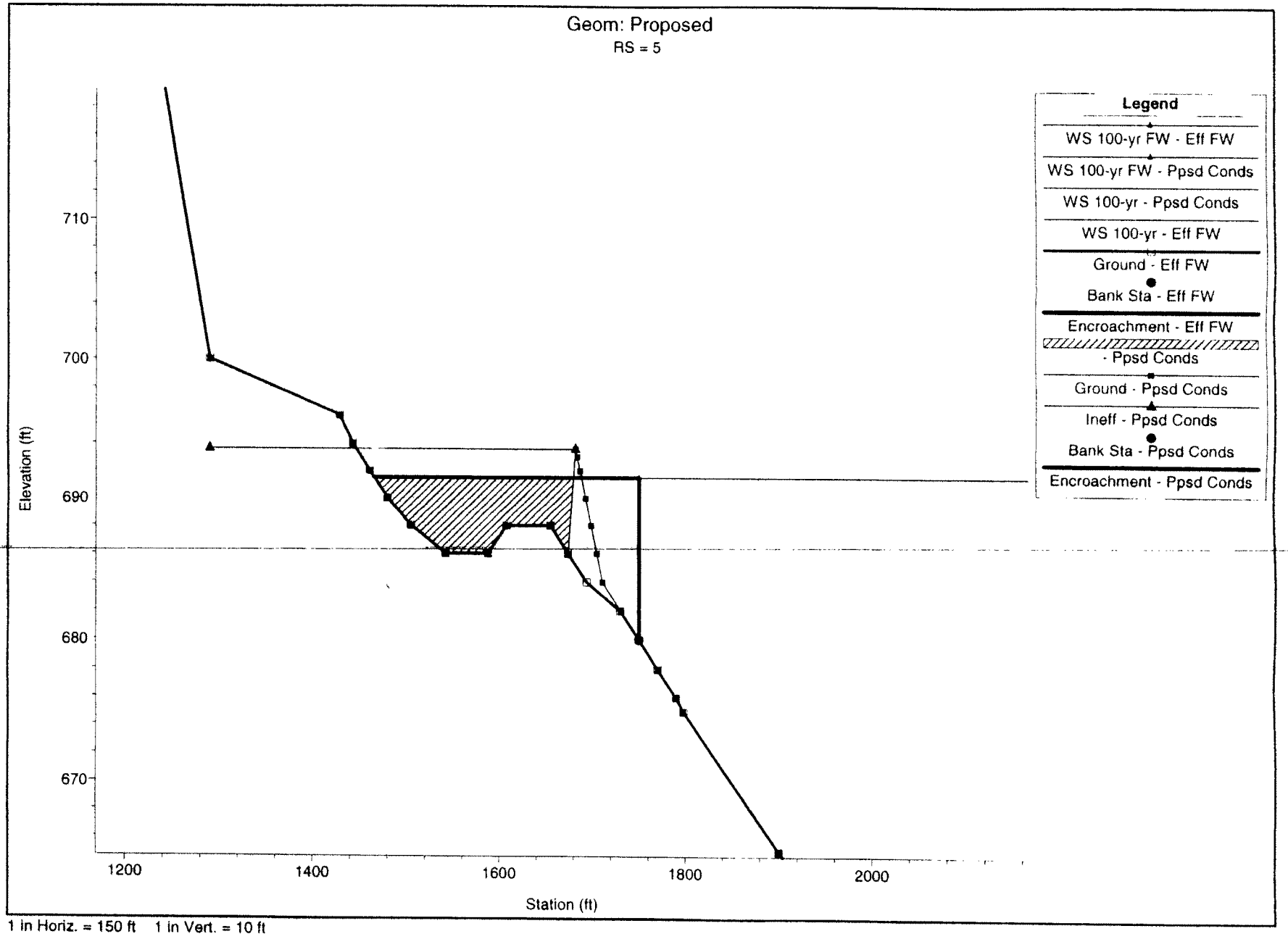
2000
3000
4000
5000
6000
7000
8000
Station (ft)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Ground - Eff FW
Bank Sta - Eff FW
Encroachment - Eff FW
- Ppsd Conds
Ground - Ppsd Conds
Ineff - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
Elevation (ft)
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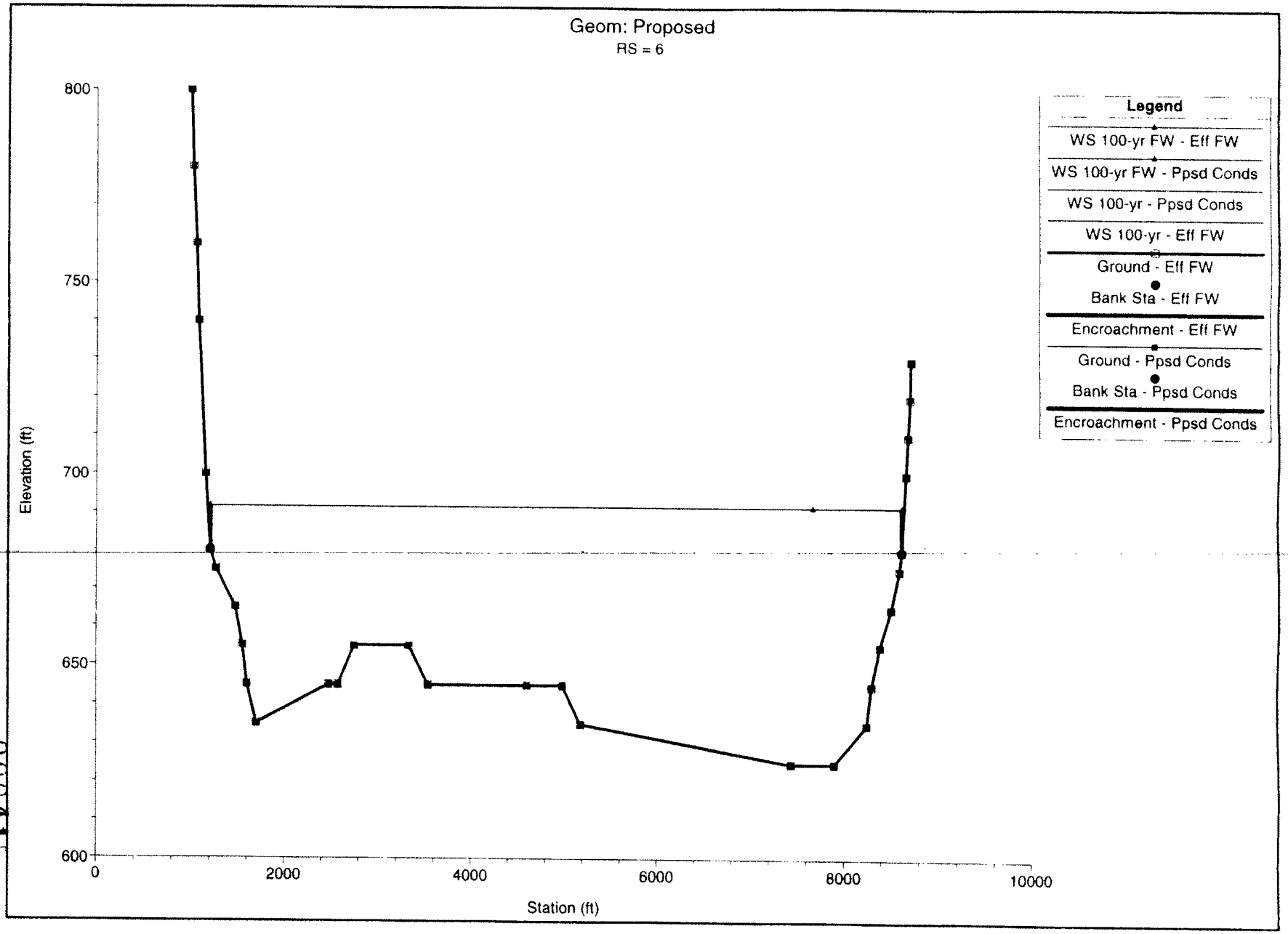
700
690
680
670
1200
1400
1600
1800
2000
Station (ft)
1 in Horiz. = 150 ft 1 in Vert. = 10 ft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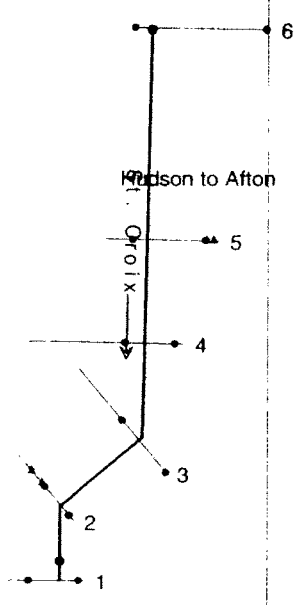
Encroachment - Eff FW
Ground - Ppsd Conds
Bank Sta - Ppsd Conds
Encroachment - Ppsd Conds
Elevation (ft)
800
750
700
650
600
0
2000
4000
6000
8000
10000
Station (ft)

000415


6
Hudson to Afton
5
4
3
2
1

Waterway and Wetland Handbook
CHAPTER 40
ORDINARY HIGH-WATER MARK (OHWM)

GUIDANCE PURPOSE AND DISCLAIMER

This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule apply. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance cannot be relied upon and does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decision made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes, common law and administrative rules to the relevant facts.

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I. Purpose

The delineation of the ordinary high-water mark (OHWM) is a critical element in the administration of Wisconsin water law and is necessary for an effective water management program. The OHWM is the boundary between riparian owned uplands and the publicly owned beds of natural lakes. It is the boundary of public rights and interest in the waters of navigable streams and lakes except when the water is above the OHWM public rights are "enlarged." When the water is below the OHWM a riparian owner has a qualified right to use the land between the actual water level and the OHWM.

Department field staff determine the OHWM through on-site investigation and analysis of physical and biological indicators on a case-by-case basis.

II. Definition of OHWM in Wisconsin

Although "ordinary high-water mark" was used in a number of Wisconsin Supreme Court cases in the 1800's, the first definition of ordinary high-water mark is found in the Wisconsin Supreme Court case Lawrence v. American Writing Paper Co. (1911), 144 Wis. 556, 562:

> ...ordinary high-water mark, that is the point up to which the presence and action of the water is so continuous as to leave a distinct mark by erosion, destruction of vegetation, or other easily recognized characteristic.

Three years later the Supreme Court redefined and expanded the definition in Diana Shooting Club v. Husting (1914), 156 Wis. 261, 272:

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> By ordinary high-water mark is meant the point on the bank or shore up to which the presence and action of the water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation, or other easily recognized characteristic.

One of the contentions in the Diana case had been that public rights in navigable waters "consists of nothing more than a right to pass to and from over the open waters" and that a person had "no right to leave the open part of the stream or push into the vegetation" growing through or above the water along the bank or shore. The Supreme Court did not accept this contention, ruling that public rights in navigable waters extend between the boundaries of the ordinary high-water marks and it is immaterial "what the character of the stream or waters is. It may be deep or shallow, clear or covered with aquatic vegetation." The Court then added the wording "on the bank or shore" and the word "terrestrial" to the Lawrence definition to emphasize that the ordinary high-water mark is not at the edge of open water adjacent to aquatic vegetation but on the bank or shore where terrestrial vegetation either begins or is destroyed.

The "distinct mark" must be manifested by "erosion, destruction of terrestrial vegetation or other easily recognizable characteristic"; however only one of the preceding manifestations need be present to qualify as such a mark. The phrase "other easily recognized characteristic" is highly significant since it allows flexibility as to what indicators in the natural environment qualify as the water-established mark.

Diana also stated:

> And where the bank or shore at any particular place is of such character that it is impossible or difficult to ascertain where the point of ordinary high-water mark is, recourse may be had to other places on the bank or shore of the same stream or lake to determine whether a given stage of water is above or below the ordinary high-water mark.

This tells us two things: the area below the ordinary high-water mark need not be covered with water at all times, and where no mark can be found, one can look for marks in other areas and transfer the information through stage or elevation readings. No court cases have specified what a reasonable distance is to find the OHWM at another site nor whether marks must be transferred from similar areas. No court decisions have modified the Diana definition. The Diana definition is flexible and gives the Department the latitude to analyze varying physical conditions.

The courts have not upheld OHWM determinations which were not based on biological or physical indicators. In the case State v. McDonald Lumber Co. (1962) 18 Wis. (2d) 173, the state charged that the defendant illegally placed fill on the bed of Green Bay. The state did not attempt to use the Diana definition to prove the fill was below the OHWM of Green Bay because all the adjacent land was disturbed. Instead, the state offered an elevation for the ordinary high-water mark based on Lake Michigan water level records compiled by the Army Corps of Engineers for the period 1860-1959. The state asserted that the average of the high-water levels recorded was 581.0 feet above sea level and thus the ordinary high-water mark was at that elevation. The trial court found McDonald guilty of filling part of the lakebed but refused to order removal of the fill because the location of the ordinary high-water mark, the boundary of the lakebed, was not proved by the state.

The Supreme Court sustained the trial court's decision ruling that "the term ordinary high-water mark has been defined in Diana Shooting Club v. Husting (1914), 156 Wis. 261, 172," and "that the location of such ordinary high-water mark was not proved by the state" by its use of water level records.

III. Public and Riparian Rights

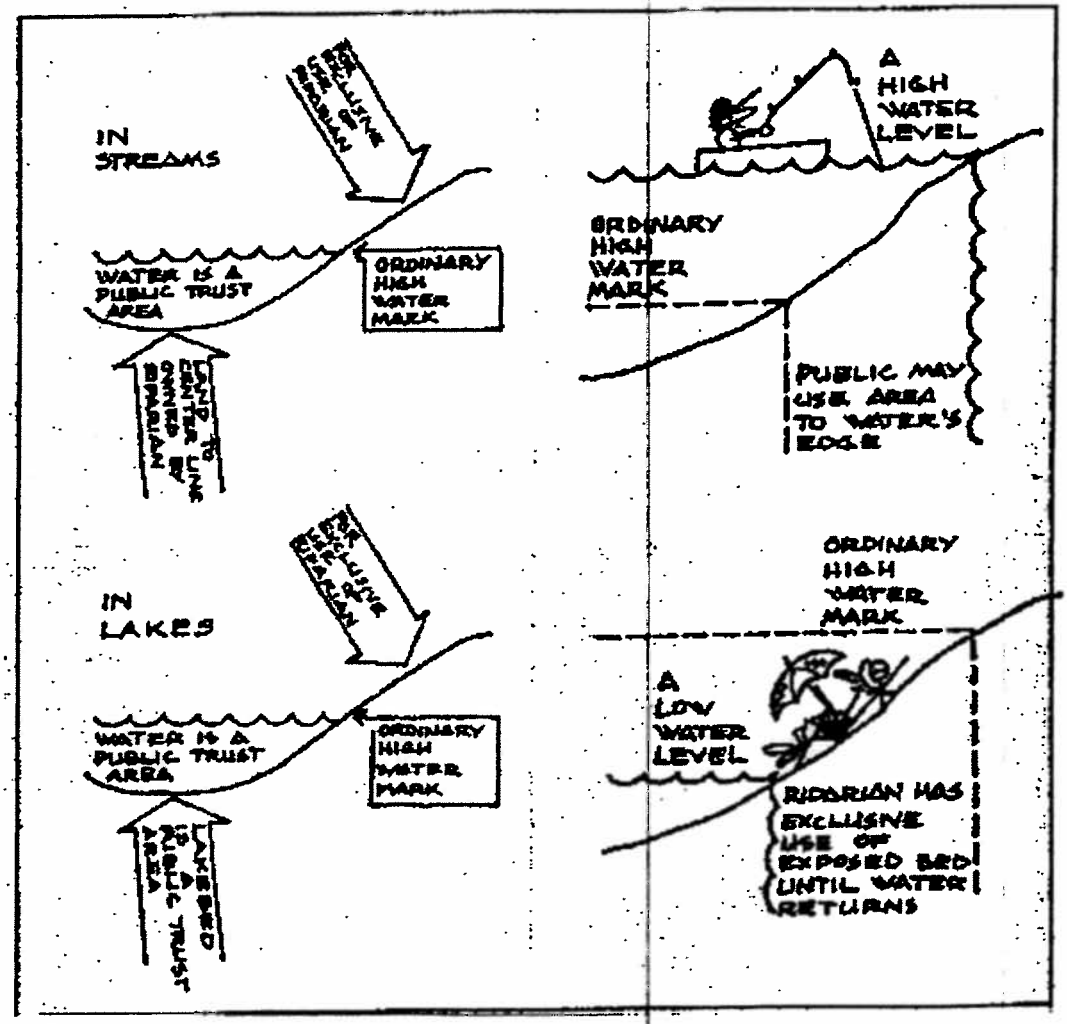
In Wisconsin riparian rights vary in accordance with the nature of the body of water. With respect to the

ownership of the bed of the stream, a riparian owner owns to the thread of the stream (Walker v. Shepardson (1855) 4 Wis. 495; Ne-pee-nauk Club v. Wilson (1897) 96 Wis. 290). The title of the riparian owner is, however, a qualified one, subject to the paramount interest of the state (Muench v. Public Service Comm. (1952) 261 Wis. 492; Ashwaubenon v. Public Service Comm. (1963), 22 Wis. (2d) 38). However, the owner of a land abutting a natural lake owns to the OHWM only, since title to the submerged lands beneath a lake belongs to the state (Angelo v. Railroad Commission (1928) 194 Wis. 543).

Private landowners whose lands make lateral contact with the waters of navigable lakes, where the state owns the bed, enjoy the exclusive right to access for private use (Delaplaine v. Chicago and Northwestern Ry Co., (1877) 42 Wis. 214). The general public can exercise its rights only if access to the water can be gained without trespassing over private property. As the recent decision in State v. McFarren (1974) 62 Wis. 2d 492, which reiterates Doemel v. Jantz (1923) 180 Wis. 225, points out:

> A riparian owner has a qualified right to the land between the actual water level and the ordinary high-water mark; he may exclude the public therefrom but he may not interfere with the rights of the public for navigable purposes.

The sketches below illustrate the public right in relation to the OHWM:



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Recall that riparian rights in Wisconsin exist by virtue of ownership of the bank or shore in contact with the water and not by title to the soil under the water (Colson v. Salzman (1956) 272 Wis. 397 and Diedrich v. Northwestern Union Ry Co. (1877) 42 Wis. 248 (involving a lake)). In Wisconsin the general rule is that the owner of the upland abutting a natural stream or body of water is presumed to possess riparian rights. However, because riparian owners may separate the riparian rights from ownership of the abutting lands it "is equally clear that one who acquires land abutting a stream or body of water may acquire no more than is conveyed by his deed" (Mayer v. Grueber, (1965), 29 Wis. (2d) 168).

The presumption in favor of owning a portion of the bed of a waterway is not applicable where an artificial lake or body of water is concerned. "An artificial lake located wholly on the property of a single owner is his to use as he sees fit, provided, of course, the use is lawful. He may if he wishes reserve to himself or his assigns the exclusive use of the lake or water rights." (Mayer v. Grueber, supra). In the Mayer v. Grueber case the court held that the "(D)efendent, who acquired part of a tract of land abutting on an artificial lake by deed described the lake front boundary as running along the easterly bank, could not successfully assert he had been accorded riparian rights to use the lake for recreational purposes as against the claim of the owners of the remainder of the tract who also had title to the submerged land, since he acquired only what was granted by the words of his conveyance - property rights up to the waters edge - and had no ownership rights in the bed of the lake and hence no rights in the waters above."

The ownership of beds underlying artificial lakes or reservoirs caused by the erection of a dam remains in the hands of the abutting owner (or deed holder) unless purchased (Haase v. Kingston Cooperative Creamery Association (1933), 212 Wis. 585). In other words, though a lake now exists, bed ownership is determined as though the prior existing stream still remained. The court ruled "(W)e think the true rule is this: where the owner of land creates an artificial body of water upon his own premises, he may permit the public to enjoy the ordinary use of such waters, and, it may be, that by the lapse of time such enjoyment will ripen into a dedication which he will not be permitted to destroy. But such a use of the waters does not amount to an adverse possession in favor of the state giving the state title to the land under the waters and..."

The court continued "(I)t is true that where waters of a natural, navigable lake are artificially raised, the public and the riparian owners enjoy the same rights in and upon such artificial waters. 'The artificial condition originally created by the dam becomes by lapse of time a natural condition.' Johnson v. Einerman, 140 Wis. 327, 122 N.W. 775. However it does not seem necessary, in order to secure to the public the right which the public has enjoyed for a period of time equal to that required by the statute of limitations, that the title to the land should be held to have thereby passed from private ownership to the ownership of the state."

Among other incidents of riparian ownership, and to preserve the riparian's access to the water, is the right to the land formed by gradual and natural accretions and uncovered by reliction. (Doemel v. Jantz supra., Attorney General Ex Rel. Bay Boom Wild Rice and Fur Co. (1920) 172 Wis. 363 and Baldwin v. Anderson (1968) 40 Wis. 2d 33).) This is true even though the riparian does not have title to the bed of a meandered lake. (Roberts v. Rust (1899) 104 Wis. 619 and Boorman v. Sunnuchs (1877) 42 Wis. 223)

One who owns both banks of a navigable or nonnavigable Wisconsin stream has title to the entire bed of the stream between the boundaries of his land. An interesting exception to the rule that a riparian proprietor owns to the thread of the stream occurs on the Mississippi River. Since that river forms the Minnesota-Wisconsin boundary, and the actual boundary line is the centerline of the main navigation channel of the river, a Wisconsin riparian does not own the bed to the thread of the river, but to the centerline of the main navigation channel (Franzini v. Layland (1903) 120 Wis. 72). The middle of the main navigation channel may be very close to the Wisconsin shore at points and equally close to the Minnesota shore at other points. Consequently, the extent of Wisconsin residents' riparian ownership of the bed would vary, depending on the location of their abutting land. Bed ownership of Lake Michigan as a natural lake is in the bordering states. State v. McDonald Lumber

Company, supra.

IV. Determining the Ordinary High-Water Mark

A. What to look for when making an OHWM Determination

1. Biological Indicators:

a. Mosses: mosses which are located on exposed rocks, stumps, tree roots, etc., are usually considered terrestrial and the lowermost elevation of these mosses is a good indicator of the OHWM. Some water mosses (e.g. Drepanocladus) form long strings and are aquatic and should not be used as indicators of the OHWM.

b. Lichen: use these indicators with care for determining the OHWM. Use them mainly for recent, relatively short duration high water stage indicators. Extended high water periods eventually will kill and remove various lichen. Types to look for:

1. Coarse brown lichen - usually lie above extreme high lake stages.

2. Black - usually removed readily by water inundation.

3. Orange Lichen - intermediate in their susceptibility to water destruction.

4. Green Lichen - the lower most elevation of this lichen can indicate the highest water mark in recent years.

c. Trees: the roots of living trees and shrubs along the shoreline will turn up and away from the water. Exposed bases and roots of older trees with roots growing primarily toward the shoreland on a horizontal plane are usually just above the OHWM if no slumpage has occurred.

1. Water roots: Willow trees on the bank will put out red-brown water roots. The start of the water roots will be very near the OHWM. Beware of slumpage.

2. Pancake roots: Birch, maples, tag alder and tamarack will form pancake shaped root mats usually just above the OHWM. Beware of slumpage.

3. Pipe elbow roots: Birch and maple will curve their roots away from water forming a pipe elbow bend. The bottom of the root as it bends away will be very near the OHWM. Beware of slumpage.

d. Pollen: pollen - especially pine pollen - often leaves marks on shore (particularly on large rocks) during spring and early summer. Not an indicator when considered by itself but will indicate recent high-water stages.

e. Large Cattail Mat: The top of large cattail mats are often slightly above OHWM. Be careful of hummocks, floating bogs and mats, but be aware of where they exist in relation to your determination site.

f. Algae stain: On rocks, stumps, etc. look for algae stain lines. On some rocks etc. it is possible that

you find a algae/lichen stain line. Algae marks should not be used as the sole basis for a OHWM determination. Because of high water stages and wave splash algae can grow above the OHWM.

2. Physical indicators: [other easily identified characteristics]

   a. Ice Scars: on trees, soil, etc. Ice marks are usually above the OHWM. Caution prevails in using these, because floods, wind and/or ice expansion can cause ice marks well above the OHWM. They are a good indication of the proximity of the OHWM and can help in a final determination.

   b. Erosion (from wave wash): try using small bays where large waves from high winds would not wash above the OHWM.

   c. Mudstains and debris: Mudstains on trees, stumps, rocks, etc. give a good indication of the proximity of the OHWM. The OHWM will usually be located below the mudstains and debris.

   d. Water stains on rocks, culverts, seawalls, etc.: Water stains on fixed objects are excellent indicators of the OHWM. Generally there will be three stain lines on the object (from the bottom) a gray band, a band of lighter color, and then another band of gray or black. The OHWM is located at the line between the lighter color band and the top dark band.

   e. Leachate marks in the soil: Dig into the immediately adjoining shoreland. Long-term water levels will sometimes leave stain marks in light colored soils known as mottling. Iron is the main coloring substance of the subsoil. Air is absent or in short supply when soils become saturated or nearly saturated with water. When air is absent in the soil, iron exists in the reduced state which is gray in color. When an air supply is present as in well drained soils, the iron is in an oxidized state which is yellowish or reddish in color. Imperfectly and poorly drained soils are nearly always mottled with various shades of gray, brown and yellow, especially within the zone of fluctuation of the water table. Some mottled colors occur unassociated with poor drainage past or present, therefore, such stains should be carefully compared with other indicators. Remember the highest past water level is not necessarily the OHWM.

   f. Change in soil types: Dig into the soil or take cores looking for a change from organic (peat-muck) to mineral soils. Although a soil developing under water may have a high mineral content (usually from water or wind born addition) a soil with a high or exclusive content of organic matter cannot form under well-drained conditions. The presence of a peat or muck profile is therefore a good indicator of a water level that is perpetually at or above the soil surface and thus of an OHWM.

B. Additional considerations

1. Cattails: don't use cattails as sole indicators of the OHWM. Cattail is a clone plant that can be found above and below the OHWM. It is extremely tolerant to extremes in water conditions.

2. Water crawfoot: extremely tolerant of dry conditions, similar to cattails.

3. Steep, cliff areas: avoid steep cliff areas because slumpage of terrestrial vegetation will undoubtedly occur.

4. Disturbed areas: avoid disturbed areas because OHWM indicators will probably be destroyed or absent. If necessary, determine the OHWM elsewhere and transfer the elevation of the OHWM to the disturbed area.

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5. Wave windrow areas: avoid wave windrow areas because aquatic and terrestrial vegetation may be smothered by wave carried materials (sand).

6. Trapped water: areas where water is trapped by ice ridges, etc., can indicate an elevated OHWM.

7. Pollen, algae marks as the sole basis: such marks are usually located above the OHWM. Pollen, especially pine pollen, often leaves yellowish marks particularly on large rocks during spring and early summer.

8. Averaging elevations of OHWM determinations. Individual determinations at the same location should be within 0.1 ft. in elevation. Do not average elevations.

9. Winds can cause increased water elevations at ends of long lakes. You may have to return on a calmer day to make an accurate determination of water level with reference to a benchmark. Water levels on the opposite sides of lakes elongated especially in an east and west direction could be effected by prevailing winds. There is therefore a possibility that the OHWM on the east and west ends of such lakes may be at different elevations. If you suspect this to be the case, level work should be tied into U.S.G.S. benchmarks or other reliable datum.

10. On lakes or flowages which are controlled by a dam, be wary of drawdowns, erratic level control operations, broken or missing flashboards, etc., that have or could affect water levels and thus the OHWM.

11. When you have a body of water with an inflow and/or an outflow one of the first things to do in an OHWM determination is to check these locations to see if there are any unusual conditions that could affect your conclusions such as blockages of the inlet or outlet, broken flashboards on the outlet dam, etc. It is also a good idea to tour most of the shoreline and note undisturbed areas before proceeding. If a map of the water body is available, these areas should be marked on the map for further investigation.

12. Remember the highest past water level is not necessarily the OHWM. Whenever possible existing past data on water level reading should be consulted in the determination of the OHWM.

13. Court decisions usually involve the question: could a prudent person have reached the same conclusion as you did in you OHWM determination?

V. How to Locate and Document the OHWM

1. Ordinary High-Water Mark determinations are to be made according to the definition in Diana Shooting Club vs. Husting 156 Wis. 261 (1914).

2. Check district and area files for previous OHWM determinations on the same waterbody. Also check all existing past water level readings.

3. Determine the OHWM using the physical and biological features (indicators) previously identified. Measure the distance of the indicators above or below the water level on the day(s) of observation. The water level on the day(s) of observation should be referenced to an easily identifiable benchmark (one method is to measure down from a culvert or wall to the water level). This benchmark (a measurement spot) should be carefully described and its exact location recorded in writing on the checklist, so that it can be found with ease at a future date if needed.

4. Find another spot near your first measurement and repeat the process. Take an adequate number of

measurements and notes before reaching a conclusion. Elevations of OHWM indicators should generally be within 0.1 feet of each other.

5. You should tie the OHWM elevation into a benchmark of known elevation. The checklist has a space for the elevation of the OHWM. This information could be especially useful when it is necessary to transfer the elevation of an OHWM to an area where there is no distinct mark. The checklist could be consulted to see if there are any OHWM determinations near the site where there was no mark. Then pursuant to Diana, the elevation can be transferred to the site where an OHWM determination is needed.

6. If early aerial photographs or maps of the area exist, they will serve as excellent evidence to support the location of a former shoreline which existed prior to disturbance. You can locate these through local Soil Conservation Services (SCS) offices, the Tomahawk DNR office and the Department of Transportation's Highway Testing Lab in Madison.

7. If you need assistance after exhausting district resources contact the Water Regulation Section.

VI. Educational Materials

There are three pamphlets produced by the Department which should be useful in educating the public on the OHWM and Wisconsin water law:

Wisconsin's Water Regulation Programs Work for You provides a general outline of water regulation permit program.

Public or Private I - Navigability discusses the concept of navigability and how it affects private rights.

Public or Private II - The Ordinary High-Water Mark discusses the relationship of the OHWM to private and public rights.

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CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

DATE: September 19, 1983 FILE REF: 3550 (WMC)

TO: District Directors

FROM: Robert W. Roden

PMMS Response
Put in: Chapter 40, Water Regulation Handbook
Chapter 15, Floodplain Shoreland Management Guidebook

Distribution: **All** Water Management and Floodplain Staff

SUBJECT: Distinction Between the Terms: "Ordinary high-water mark", "Normal high-water elevation", and "High Water Mark".

1. Are the terms "nomal high-water mark" and "ordinary high-water mark" synonymous? If so, why was "nomal" changed to "ordinary" in Chapter 330, Laws of 1981?

   As used in s. 59.971, 1979, Stats., the phrase "normal high-water elevation" is synonymous with the phrase "ordinary high-water mark." The Department has consistently interpreted the phrase "normal high-water elevation" in s. 59.971 to mean the same as "ordinary high-water mark," and the Wisconsin Supreme Court has never indicated (or even hinted) that " normal high-water elevation" is something different than "ordinary high-water mark" (either before or after the enactment of Chapter 614, Laws of 1965, which created s. 59.971, Stats.)

   We have no idea why the drafter of Chapter 614, Laws of 1965 (which created s. 59.971) used the phrase "nomal high-water elevation" in s. 59.971 in the first place, since the Wisconsin Supreme Court has used the terminology "ordinary high-water mark" consistently since 1911, when the term was first defined in Lawrence vs. American Writing Paper Company, 144 Wis. 556 (1911). It seems reasonable to assume thereby the reasons for changing "normal" to "ordinary" (and "elevation" to "mark") in Chapter 330, Laws of 1981, were:

   a. To make the statutory language identical to the terminology used by the Wisconsin Supreme Court; and

   b. To avoid confusion with the concept of mean (or average) water level which is sometimes described as the "normal stage of water" or the "normal water elevation." See, for example Polebitzke vs. John Week Lumber Company, 163 Wis. 322, 325-326 (1916).

2. What is the distinction between "ordinary high-water mark" and "high watermark"? If there is no distinction, is the statute language flawed?

   There is a distinction between the concept of "ordinary high-water mark" and the concept of "high watermark" (or "high-water mark"). However, there may be no practical distinction when it comes to applying the two concepts to a particular body of water at a particular time. "Ordinary high-water

mark" is defined in State vs. McFarren, 62 Wis. 2d 492, 498 (1974) as "the point on the bank or shore up to which the presence and action of water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation, or other easily recognized characteristic."

The phrase "high watermark" (or "high-water mark") refers to the mark left by flood waters or several years of high groundwater causing the water level to increase to a substantially higher level.

Glacial pothole lakes were apparently singled out for special treatment in s. 59.971 because these high water levels in glacial pothole lakes usually remain above the lower "ordinary high-water mark" for several years or more. It was intended that shoreland zoning should apply to areas within 1000 feet of the "high watermarks" of these glacial pothole lakes because often the lower "ordinary high-water marks" would be inundated and could not be located. After the floodwater or groundwater stabilizes to a constant elevation, there should be no difference between this elevation and the ordinary high-water mark.

As a reminder, one should be aware of the fact that a body of water need not be a glacial pothole for this situation to occur on. Many lakes in this state are subject to substantial fluctuations in their water level to the extent that new ordinary high water marks are established. The fact that glacial potholes are specifically mentioned in the statute is because they are typically more prone to these fluctuations than other lakes.

RWR:LW:sm
Reviewed by: Bill Marlett
Linda Wymore
Scott Hausmann
Larry Larson

3927K

CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

DATE: June 14, 1984 3500
(WMC)

TO: District Directors

FROM: Robert W. Roden - WRZ/5

PMMS Response
Put in: Chapter 40, Water Regulation Handbook

Distribution: All Program Staff

SUBJECT: Operation of Motor Vehicles in Water Prohibited

We have been asked if operation of a motor vehicle upon the exposed bed of a lake or stream under low water conditions is a prohibited activity under section 30.29 Wis. Stats.

Section 30.29(2) states no person may operate a motor vehicle in any navigable waters of the state with the exceptions identified in 30.29(2). Review of the Legislative history of 30.29 shows that the term in any navigable waters is meant to include the bed of any water of the state below the OHWM. Therefore, operation of a motor vehicle on the exposed bed below the OHWM, subject to the exceptions of 30.29(3), could be regulated under 30.29(2) and the operator subject to enforcement and penalty under 30.29(4).

It should also be noted that State v. McFarren (1974) 62 Wis. 2d 492, points out:

A riparian owner has a qualified right to the land between the actual water level and the ordinary high water mark; he may exclude the public therefrom but may not interfere with the rights of the public for navigable purposes.

Therefore, any operation of a motor vehicle upon the exposed bed of a lake or stream would be subject to the consent of the affected riparian owner(s). Riparian owners may deny access to the exposed bed and prosecute an operator for trespass if they so desire. They may not, however, deny access by the installation of a fence or similar physical structure constructed or placed below the ordinary high water mark unless a permit has been issued under 30.12.

Reviewed By: John Coke
Scott Hausmann
Mike Cain

000428

CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

Date: July 30, 1984 File Ref: 3500
(WMC)

To: District Directors

From: Robert W. Roden

PMMS Response
Put in: Chapter 40, Water Regulation Handbook

Distribution: All Program Staff All Conservation Wardens

Subject: Operation of Motor Vehicles in Water Prohibited

Upon further discussion with the Bureaus of Legal Services and Law Enforcement concerning the legislative history of ss. 30.29, it has been determined that the June 14, 1984, memo on this subject was in error. Therefore, the June 14, 1984, memo on this subject is hereby rescinded and is to be replaced by the following:

Section 30.29(2), Statutes, states no person may operate a motor vehicle in any navigable waters of the state with the exceptions identified in ss. 30.29(3). The legislative intent in using the term "in any navigable waters" was to specifically exclude regulation of motor vehicles on the exposed beds. Therefore, as long as the vehicle is not actually operated in the water, such activity would not be regulated under ss. 30.29.

It should also be noted however that State v. McFarren (1974) 62 Wis. 2d 492, points out:

> A riparian owner has a qualified right to the land between the actual water level and the ordinary high watermark; he may exclude the public therefrom, but may not interfere with the rights of the public for navigable purposes.

Therefore, any operation of a motor vehicle upon the exposed bed of a lake or stream would be subject to the consent of the affected riparian owner(s). Riparian owners may deny access to the exposed bed and prosecute an operator for trespass if they so desire.

Reviewed by: John Coke
Scott Hausmann
Mike Cain
Dale Morey

000429

CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

DATE: May 15, 1985 3550
(WMC)

TO: District Directors

FROM: George E. Meyer - AD/5

PMMS Response
Insertion: Chapter 40, Water Regulation Handbook

Distribution: Program Staff
All Conservation Wardens

SUBJECT: Operation of Motor Vehicles in Water Prohibited

We have been provided with additional information that indicates the July 30, 1984 memo on this subject was in error. The original proposal to create section 30.29, Wis. Stats., prohibited operation of a motor vehicle "in the waters of the state or on the bed of any water of the state below the high water mark." Section 30.29(2) now states "in any navigable waters of the state." Our previous memo of July 30, 1984 was based on information that the reason for the change in section 30.29(2) was to exclude regulation of vehicles operated on exposed beds. We have now been informed that the reason for the change to drop "on the bed..." was simply due to the fact that the term "in any navigable waters" includes the exposed bed below the ordinary high water mark and the original wording was simply repetitious.

Therefore, our policy shall be that operation of a motor vehicle on the exposed bed below the OHWM, subject to the exceptions of 30.29(3), is regulated under 30.29(2) and the operator subject to enforcement and penalty under 30.29(4).

It should also be noted that State v. McFarren (1974) 62 Wis. 2d 492, points out:

> A riparian owner has a qualified right to the land between the actual water level and the ordinary high water mark; he may exclude the public therefrom but may not interfere with the rights of the public for navigable purposes.

Therefore, any legal operation of a motor vehicle upon the exposed bed of a lake or stream under the exceptions identified in 30.29(3) would be subject to the consent of the affected riparian owner(s). Riparian owners may deny access to the exposed bed and prosecute an operator for trespass if they so desire.

Reviewed By: John Coke
Scott Hausmann,
Mike Cain
Dale Morey

JC:slh
6421K

000430

CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

Date: June 17, 1987 File Ref: 3500

To: Water Management Coordinators
Water Management Specialists
Water Regulation Staff

From: Dale Simon

Subject: Ordinary High Watermarks

Attached for your information and use is a brief explanation of issues relative to ordinary high watermark determinations.

Hopefully the plant species list will assist you in your OHWM determinations. Eventually each district will have a list of plant species most commonly found in your geographic region.

If you would like to add to this list, please send your information to me. Please contact me if you have any questions.

DS:el
Attach.

cc: Bob Roden/Scott Hausmann - WZ

ORDINARY HIGH WATER MARK

Definition

Ordinary high water mark - "the point on the bank or shore up to which the presence and action of the water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation or other easily recognized characteristic." Diana Shooting Club v. Husting (1914), 156 Wis. 261, 272.

Refer to Chapter 40, Water Regulation Handbook for additional information.

Bed of the waterbody between normal water level and OHWM need not be navigated to assert state jurisdiction (clarified in the Trudeaux case).

Considerations prior to making an OHWM Determination

1. The ultimate decision you make should meet the "reasonable-prudent test." Could a prudent person come to the same conclusion as you?

2. Can you defend your determination sufficiently to hold up in court? This becomes a very important issue where multiple OHWMs are present. Very common for lakes.

3. What kind of documentation will you rely upon to verify your determination? (Plants, water stains, wash marks, etc.) How can someone else varify the location of the OHWM? Will you take photos? Do you need a survey and benchmarks? Will you retain a record of your determination? How? Where?

4. Department liability. As a representative of the state you make a decision that carries great weight. Not only in the sense of determining public and private rights, but your decision is also a potential liability to the state. Recent legislation allows one who is regulated to recover costs and damages for invalid determinations where the judicial system finds the state has erred (see s. 227.115, Stats.). In other words, mistakes can cost lots of dollars.

5. Are you dealing with an altered waterway? Is it a flowage, perched lake or a stream with beaver problems? What has the average annual precipitation been in the past? What is it for the existing year? Are water levels too high (e.g., spring)? Is the waterway frozen (this can have a significant bearing on floating bogs)? All of these factors and more can have a bearing on your ultimate OHWM determination.

Ordinary high water marks are generally established by the presence of water at a given elevation for a minimum of 30-70 days a year, over a twenty year period. Water marks similar to OHWMs can be established in a short period of time. Rely upon OHWM indicators that reflect a long time period. An ordinary high water mark that is indicative of the longest time period will generally be the easiest to defend.

The recommended procedure for determining an OHWM is to identify mature woody upland vegetation and work your way waterward. As you progress waterward you will find transitional plants (plants found above and below the OHWM) and aquatics (plants always found below the OHWM) . Fine tuning of an

OHWM can be accomplished with physical indicators, those generally being wash marks, water stains and soil mottling. These procedures should be repeated on the same waterway at various locations to verify your original determination. Consistent multiple determinations will contribute to your credibility and ability to defend your final decision. Although you cannot use only water level records for the basis of your determination, this data can be used to support or validate your decision. The same holds true for historic photographs and other ancillary data.

Multiple Ordinary High Watermarks - "The Dilemma"

Occasionally you will find yourself in the situation of deciding which one of several distinguishable OHWMs is the right one. The primary factor governing your decision should be which one do you feel most comfortable with and capable of defending. Secondary factors affecting your decision would include parameters generally associated with public interest values such as fishing, swimming, navigation, fish and wildlife habitat, etc. An OHWM that provides protection to these public rights can be used in your defense of an OHWM determination.

That is got to say that these public interest values should dictate your decision (the criteria in Diana dictates your decision!); however, one can effectively argue the benefits to the public interest associated with your determination versus a lower OHWM that does not include these public benefits. One thing you can almost always count on is that your decision will not satisfy everyone's concern.

The following list of plants are indicators that you can utilize in your OHWM determinations. As time progresses this list will expand. If any of you have additional species that you would recommend we add to the list, please share your information.

Aquatic Plants Found Below the OHWM

Scientific Name	*Common Name*
Ranunculus reptans	Creeping buttercup
Dulichium arundinaceum	Three-way sedge
Juncus pelocarpis	N/A
Elodea (Anacharis) canadensis	Waterweed
Eleocharis sp.	Spike rush
Najas lp.	Bushy pondweed
Neobeckia aquatica	Lake cress
Nasturtium officinale	Water cress
Eriocaulon septangulare	Pipewort
Heteranthera 2y.	Mud plantain
Utricularia sp.	Bladderwort
Carex stricta	Niggerhead
Carex comosa	N/A
Carex crus-corvi	N/A
Potamogeton sp.	Pondweed
Zizania aguatica var. angustifolia	Wild rice

Scientific Name	*Common Name*
Nelumbo lutea	American lotus
Nymphia sp.	White water lily
Nuphar microphyllum	Yellow water lily
Potentilla palustris	Marsh cinquefoil
Sparganium lp.	Bur reed
Brasenia schreberi	Water shield
Sagittaria sp.	Arrowhead
Megalodonta Beckii	Water marigold
Potenderia cordata	Pickerelweed
Scirpus fluviatilis	Giant Bulrush
Scirpus validus	Soft Stem Bulrush
Chamaedaphne calvculata	Leather leaf

Transitional Plants Found Above and Below the OHWM

Scientific Name	*Common Name*
Circuta maculata	Water hemlock
Hypericum perforatum	St. John's-Wort
Leersia oryzoides	Cutgrass*
Isoetes sp.	Quillwort*
Alismia gramineum	Water plantain*
Calla palustris	Water arum
Acorus calamus	Sweet flag*
Cyperus sp.	Nut grass*
Alnus sp.	Alder
Typha latifolia	Cattail
Phalaris arundinacea	Reed canary grass
Phragmites maximus	Reed grass
Salix sp.	Willows
Acer saccharinum	Silver maple
Fraxinus americana	White ash
Fraxinus nigra	Black ash
Fraxinus pennsylvanica	Green ash
Larix laricina	Tamarack
Drosera rotundifolia	Round-leaved sundew
Betula nigra	River birch
Cirsium arvense	Canada thistle
Symplocarpus foetidus	Skunk cabbage
Asclepias incarnate	Swamp milkweed*
Solidago graminifolia	Lance-leaved Goldenrod
Polygonum punctatum	Smartweed
Solanum dulcamara	Purple nightshade
Equisetum sp.	Horsetail
Iris versicolor	Blue flag
Iris pseudacorus	Yellow figg
Quercus bicolor	Swamp white oak
Chelone glabra	Turtlehead
Populus deltoides	Cottonwood
Rumex crispus	Curly dock
Impatiens capensis	Jewelwed*

*Most often located below the OHWM

Plants Commonly Found Above the OHWM

Scientific Name	*Common Name*
Quercus rubra	Red oak ✓
Quercus alba	White oak ✓
Acer rubra	Red maple
Betula lutea	Yellow birch
Betula papyrifera	White birch
Asclepiias syriaca	Common milkweed
Solidago altissima	Tall goldenrod
Pinus sp.	All species of pine ✓
Cichorium intybus	Chicory
Alopecurus ramosus	Foxtail
Canabis sativa	Marijuana
Plantago major	Common Plantain
Xanthium strumarium	Cocklebur
Fragaria virginiana	Common strawberry
Prunella vulgaris	Heal-all
Urtica dioica	Stinging nettle
Pilea pumila	Clearweed
Setaria sp.	Foxtail
Tragopogon dubius	Yellow goatsbeard
Tradescantia virginiana	Spiderwort
Ratibida pinnata	Prairie coneflower
Rudbeckia hirta	Blackeyed susan
Erigeron annus	Daisy fleabone
Plantago lanceolata	English plantain
Daucus carota	Queen Anne's lace
Heracleum lanatum	Cow parsnip
Verbascum thapsus	Common mullein
Oenothera biennis	Evening primrose
Capsella bursa-pastoris	Shepherd's Purse
Trifolium pratense	Red clover

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CORRESPONDENCE/ MEMORANDUM **STATE OF WISCONSIN**

DATE: July 26, 1993 FILE REF: 3500

TO: All WR&Z Guidebook Holders

FROM: Dale Simon WZ/6

SUBJECT: OHWM Description Checklist - Form 3500-46.

Some time ago, when I was reviewing program forms, Form 3500-46 was DELETED. Unfortunately, I must not have told anyone else.

Please remove this form from your guidebook, if you still have it in there. It is no longer an official form. The implication is that if it is in your guidebook (even though only a guide) then you should use it for all OHWM determinations.

Also, in Chapter 40, page 40-6, V. 2. cross off the sentence: (This is a good reason to use the Ordinary High-Water Mark Descripton check list, form 350046.) and also cross off paragraph V. 3.: Document every OHWM determination on the Ordinary High-Water Mark Description Checklist, form 3500-46. A copy of the OHWM checklist should be filed with both the district and Madison office.

Sorry I didn't get this to you earlier.

TILTON & DUNN, P.L.L.P.

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To: Mark Kjelhang

Date: 9/16/05 Fax No: 952-401-8798

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Mark - Here is Chapter 40 - Wis. DNR's HWM Manuals. The Supreme Ct cases are quoted on pp 1-2. My printer is on the fritz, so I'll be sending in 2 batches - odd #s, then even #s

Thanks - Bill Tilton

From:

Direct Dial Number: (651) 224-7687 Fax Number: (651) 224-0239

IF YOU HAVE TROUBLE RECEIVING ANY PART OF THIS TRANSMISSION, PLEASE CONTACT KELLY OR NICOLE AT (651) 224-7687. THANK YOU.