



November 12, 2020

Todd Knepfel, Town Chairman
New Hope Town Board
Town of New Hope
1167 Maple Ridge
Amherst Junction, WI 54407

Re: Sunset Lake Water Levels
Town of New Hope, Wisconsin

Subject: Hydrologic Evaluation

Dear Mr. Knepfel:

Enclosed for your review and use is the subject Technical Memorandum prepared by Sand County Environmental, Inc. The Memorandum was produced in accordance with our proposal to you dated September 15, 2020.

We appreciate the opportunity to provide environmental consulting services to the Town. If we can be of further service, please contact me by phone at 715.824.5969 or by email at pete.arntsen@sandcountyenv.com.

Sincerely,

SAND COUNTY ENVIRONMENTAL, INC.

Pete Arntsen, MS, PH, PG
Senior Hydrologist

Enclosure: Technical Memorandum



Technical Memorandum

To: New Hope Town Board
From: Pete Arntsen, MS, PH, PG; Senior Hydrologist/Sand County Environmental, Inc.
Date: November 12, 2020
Re: Sunset Lake Water Levels
Town of New Hope, Wisconsin
Subject: Hydrologic Evaluation

INTRODUCTION

Sunset Lake in the Town of New Hope, Portage County, Wisconsin, is experiencing high water levels that have not been noted in recent history. In places, the high water levels have extended inland to the point of submerging residential properties, flooding outbuildings, and encroaching on residences. Questions have been raised regarding potential actions that could be implemented to reduce the water levels. Prior to implementing any actions, the New Hope Town Board sought better understanding of the hydrologic conditions affecting the high water levels. Sand County Environmental (fka Sand Creek Consultants) was retained to provide a hydrologic analysis of the Sunset Lake situation.

PURPOSE

The purpose of this Technical Memorandum is to provide a professional evaluation of hydrologic conditions at Sunset Lake and the surrounding watersheds.

REGIONAL CONDITIONS

General Location

The Town of New Hope is located in the east-northeast part of Portage County, Wisconsin. Sunset Lake is located near the middle of the Township. The Township and Lake are indicated on **Figure 1**.

Topography

The topography in the Town of New Hope is primarily rolling and pitted uplands, with young river systems in the west portion and kettle lakes in the east. Topographic highs exceeding 1,240 feet above mean sea level (ft MSL) occur in several locations, primarily north and south of the string of lakes in the central part of the Township. Topographic lows occur along the Tomorrow River and Poncho Creek, dropping below 1,070 ft MSL near the southwest corner of the Township, and below 1,040 feet where Nace Creek exits the Township near the southeast corner. A topographic map of the Township is included as **Figure 2**.

Hydrology

New Hope is the headwaters for three DNR Priority Watersheds: The Tomorrow/Waupaca River basin in the west, the South Branch of the Little Wolf River in the east, and the Upper Little Wolf River in the north. The three watersheds converge a short distance northeast of Sunset Lake (**Figure 3**).

The Poncho Creek/Tomorrow River valleys convey water north to south near the west edge of the Township. Flume Creek drains water from the northwest corner and out of the Township to the north. Nace Creek drains water from Rinehart Lake out of the Township to the east.

Kettle Lakes including Reton, Hintz, Sunset, Minister, Skunk, Severson, Onland, and Rinehart occur in the central parts of the Township. None of the lakes has a surface water inlet, and except for Rinehart, no lake has a surface water outlet. The lakes receive stormwater runoff from their respective drainage basins via overland flow and groundwater infiltration, and lose water through evapotranspiration and groundwater seepage.

Geology

The soils present in New Hope (**Figure 4**) reflect the glacial origins of the Township geology. Most of the soils developed in sandy glacial till, while a smaller fraction developed in glacial outwash deposits. Two areas have surface soils of recent alluvial and/or pluvial deposits.

The glacial deposits are grouped with the Mapleview member of the Horicon formation. The material is described as calcareous sandy till. Grain sizes include up to 20% gravel, with the non-gravel fraction 80% to 90% sand and the remainder silts and clays. The sediments are mostly unbedded (Clayton, 1986). The unconsolidated deposits are typically more than 100 feet thick.

The underlying bedrock is Precambrian crystalline rock, with Wolf River granite beneath the south half of the Township, and Red River adamellite in the north (Greenberg and Brown, 1986).

Hydrogeology

Virtually all the surface waters in the Township are a result of the unconfined aquifer intercepting the ground surface. The groundwater elevation is highest in the northwest part of the Township and lowest in the southeast (**Figure 5**). Groundwater flow generally mirrors the surface water drainage patterns within each watershed: to the south and west in the Tomorrow/Waupaca River Watershed; to the north in the Upper Little Wolf River Watershed; and to the southeast in the South Branch of the Little Wolf River Watershed. However, this does not appear to be the case for water in Sunset, Minister, and Skunk Lakes. Although the water bodies are included in the Tomorrow/Waupaca River Watershed, groundwater flow from these lakes is towards the east and into the South Branch of the Little Wolf River Watershed.

Precipitation

Precipitation data for the City of Stevens Point was downloaded from the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Field Office Technical Guide (FOTG)¹. The results were imported into a spreadsheet, and a printout is included in the attached **Weather Data**. The results show that the average annual precipitation between 1913 and 2019 was 32.66 inches.

The amount of precipitation received between 2010 and 2019, relative to receiving an average amount over the period, was an additional 46.94 inches: nearly four feet more than typical over a decade. For the period

¹ <http://agacis.rcc-acis.org/?fips=55097>

2001 to 2010, the amount of precipitation received was 2.69 inches more than if average precipitation amounts were received: scarcely above average.

EVALUATION

The Portage County on-line geographic information system (GIS)² was accessed to view aerial photographs from 2020 and 2010, and surface contour lines at intervals down to 1 foot. The photographs and contours allowed surface water elevations to be estimated and surface water flow directions to be inferred. The information was transferred to a copy of the New Hope, WIS. 7.5-Minute Quadrangle map (United States Geological Survey, 1969) and is included as **Figure 6**. The Figure reflects much of what is presented in the Regional Conditions section above.

The surface water elevation in Sunset Lake determined from the 2020 aerial photograph was between 1,108 and 1,109 ft MSL. Similar values were determined for Minister Lake, Hintz Lake, and the wetlands west of Sunset Lake. The highest water elevation determined, an elevation of 1,109 ft MSL, was at a pothole positioned about halfway between Hintz and Sunset Lakes. The water elevation in Skunk Lake was estimated to be 1,107 ft MSL, and water elevations continued to decrease farther to the east (e.g., 1,105, 1,101, 1,091, and 1,064). Water elevations to the north dropped to 1,107 ft MSL, and then to 1,103, 1,100, and 1,099. Water elevations to the southwest at Reton Lake 1,005 ft MSL, dropping to 1,104, 1,101, 1,099, and 1,098. The water elevation in Onland Lake was 1,099 ft MSL and in Rinehart Lake 1,091 ft MSL, with Nace Creek dropping to 1,072 ft MSL near the Township border.

The flow patterns and relative water elevations are expected to remain consistent over time.

A map similar to Figure 6 was created using water elevations estimated from the 2010 aerial photograph (**Figure 7**)³. For Hintz, Sunset, and Minister Lakes, the water elevation was determined to be less than 1,104 ft MSL. Skunk Lake was determined to be <1,102 ft MSL. The water elevation in Onland Lake was <1,097 ft MSL, and in Rinehart Lake <1,090 ft MSL. The differences in water extents can be discerned on the aerial photographs of the respective years (**Figures 8 and 9**).

CONCLUSIONS

The high water levels in Sunset Lake (and others) in the Town of New Hope is due to greater than average precipitation received during the preceding five years, and the absence of surface water outlets. The transmissivity of the aquifer is insufficient to keep up with the above-average precipitation amounts, resulting in the water table and surface water elevations rising. During periods of near-average precipitation amounts, it is presumed that lake levels are at or below the ordinary high water mark, and that periods of below-average precipitation results in low lake levels.

² <https://portagecowi.maps.arcgis.com/apps/webappviewer/index.html?id=1406812931d14616a1b4577c8c288978>

³ Most water levels were below the lowest ground surface contour adjacent to the water body. The absence of contours is assumed to reflect that the contours terminated at the water edge that was present at the time of survey. This suggests that the minimum contours reflect the water elevations at the time of survey.

The highly porous nature of the aquifer materials and the absence of surface water outlets result in an area of very flat groundwater hydraulic gradient near Hintz, Sunset, Minister, and Skunk lakes. These physical characteristics cause water levels in the area to rise and fall at similar rates, thus maintaining similar elevations.

QUALIFICATIONS OF AUTHOR

Pete Arntsen is a senior hydrologist at Sand County Environmental, Inc. (fka Sand Creek Consultants), working at their Amherst office. He is a licensed professional hydrologist and a licensed professional geologist. Mr. Arntsen has over 30 years of experience as a private sector environmental scientist, most of it investigating and evaluating groundwater. Pete's experience in Portage County began in 1982 as an undergraduate student at the University of Wisconsin – Stevens Point College of Natural Resources, continued through 1990 as a graduate student working for Dr. Byron Shaw, and culminated as a scientist investigating and remediating contaminants released to the environment throughout Wisconsin and the Midwest.

REFERENCES

- Clayton, L, 1986, *Pleistocene Geology of Portage County, Wisconsin*, Information Circular 56, Wisconsin Geological and Natural History Survey, University of Wisconsin – Extension, Madison, Wisconsin.
- Greenberg, J.K, B.A. Brown, 1986, *Bedrock Geology of Portage County, Wisconsin*, Map 86-3, Wisconsin Geological and Natural History Survey, University of Wisconsin – Extension, Madison, Wisconsin.
- Portage County, 2017, *Comprehensive Plan Town of New Hope Portage County, Wisconsin* Portage County Planning and Zoning Department, Stevens Point, Wisconsin.
- United States Geological Survey, 1969, *New Hope Quadrangle, Wisconsin-Portage County, 7.5 Minute Series (Topographic)*, United States Department of Interior Geological Survey

LIST OF ATTACHMENTS

Figures 1 through 9
Weather Data

Figures

Figure 1: Town of New Hope and Sunset lake Location Map

Figure 2: Topographic Map of the Town of New Hope

Figure 3: Surface Water Map of the Town of New Hope

Figure 4: Soil Map of the Town of New Hope

Figure 5: Water Table Contour Map of the Town of New Hope

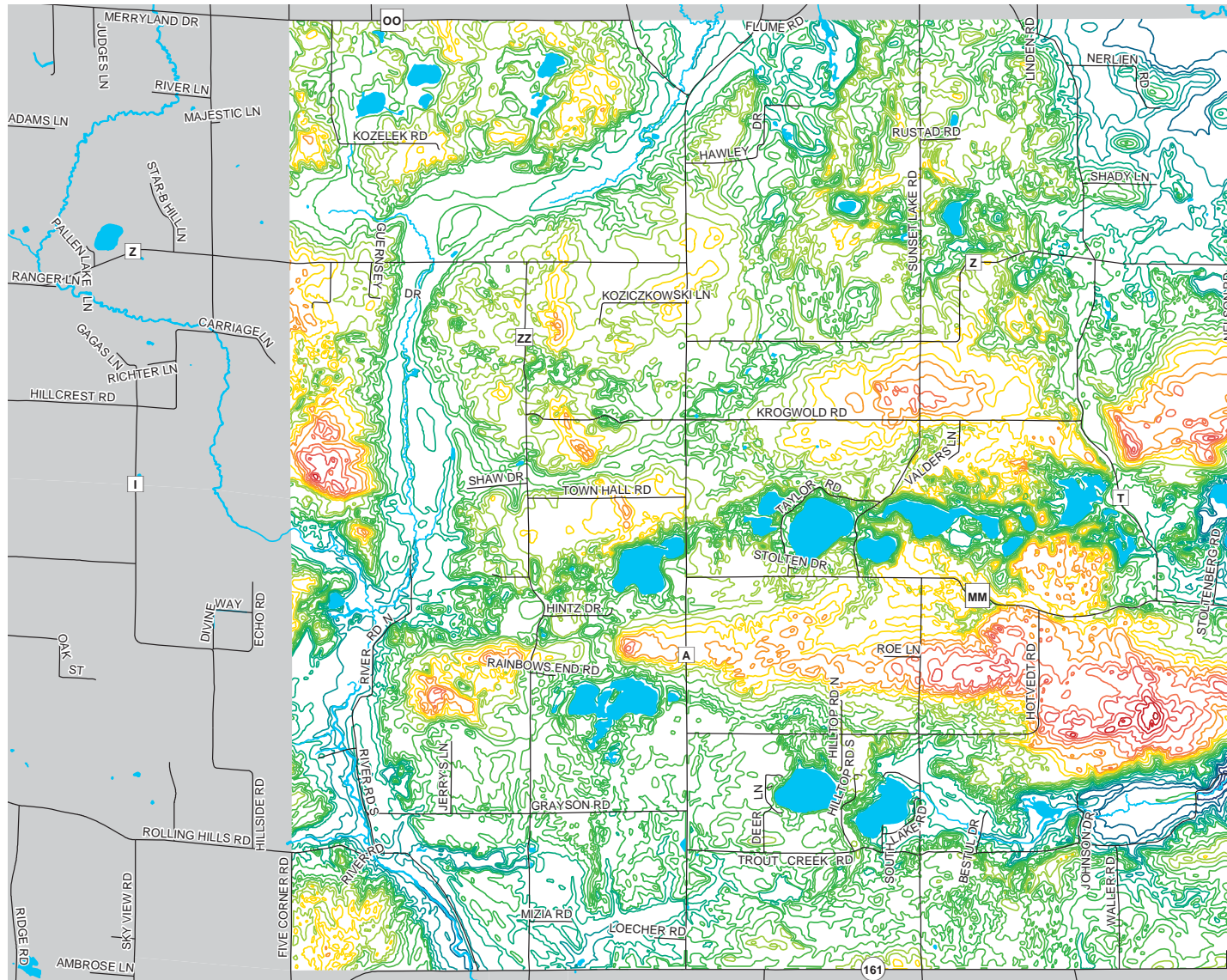
Figure 6: 2020 Surface Water Elevations and Water Flow Map

Figure 7: 2010 Surface Water Elevations and Water Flow Map

Figure 8: 2020 Aerial Photograph and Surface Contours near Sunset, Minister, and Skunk Lakes

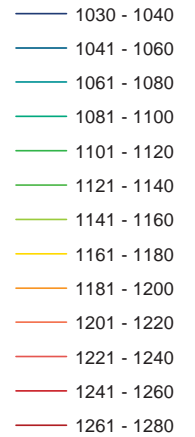
Figure 9: 2010 Aerial Photograph and Surface Contours near Sunset, Minister, and Skunk Lakes

Figure 2: Topographic Map of the Town of New Hope



Map 5.2 Topography

Elevation Ft. Above Sea Level



Source: Portage County Planning & Zoning (2017)
U.S. Geological Survey (1967-1971)

Town Board Adopted: October 24, 2017
County Board Adopted: December 19, 2017

Town of New Hope Comprehensive Plan



Portage County
Planning & Zoning
1462 Strongs Ave.
Stevens Point, WI 54481

Figure 3: Surface Water Map of the Town of New Hope

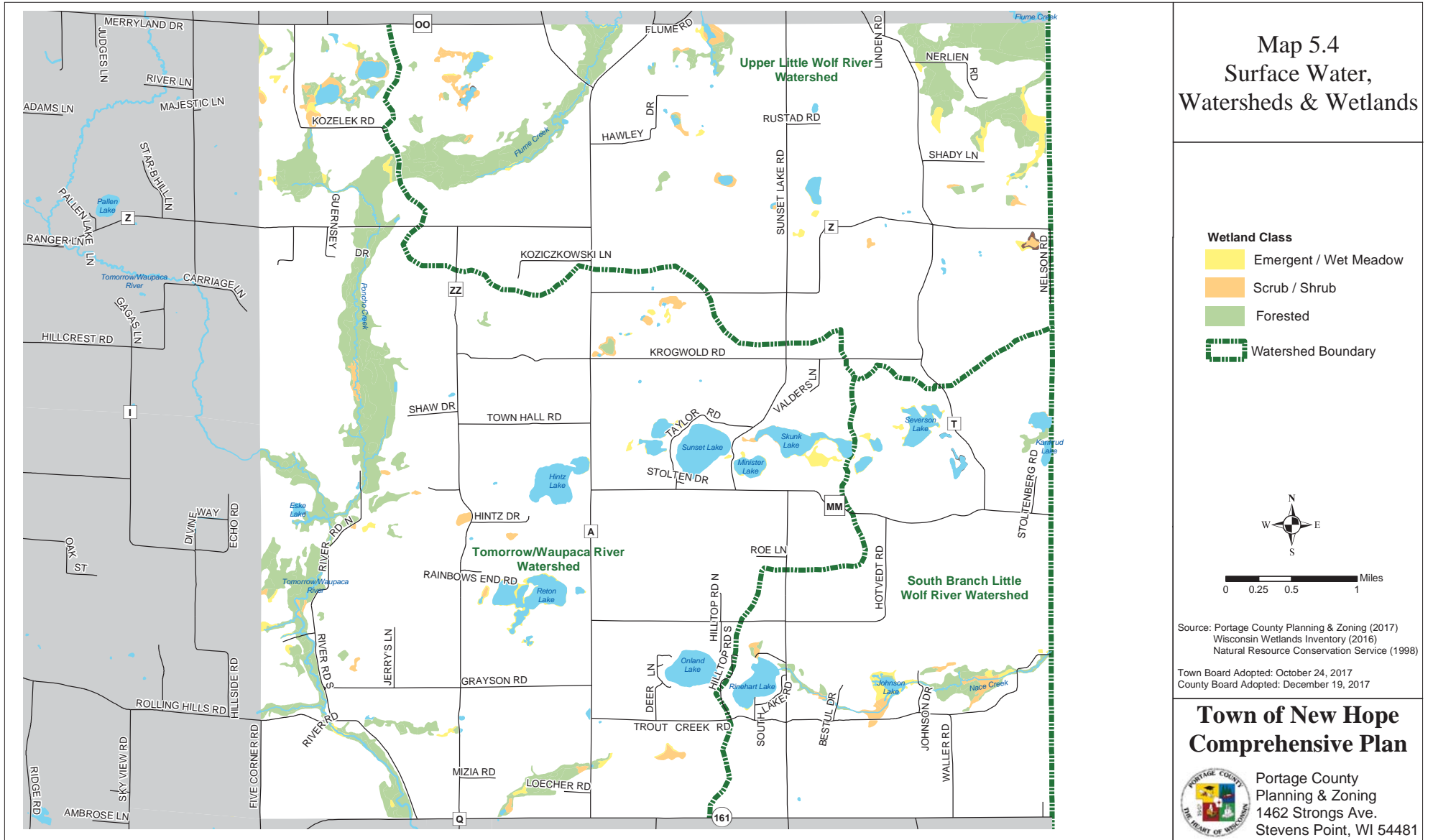
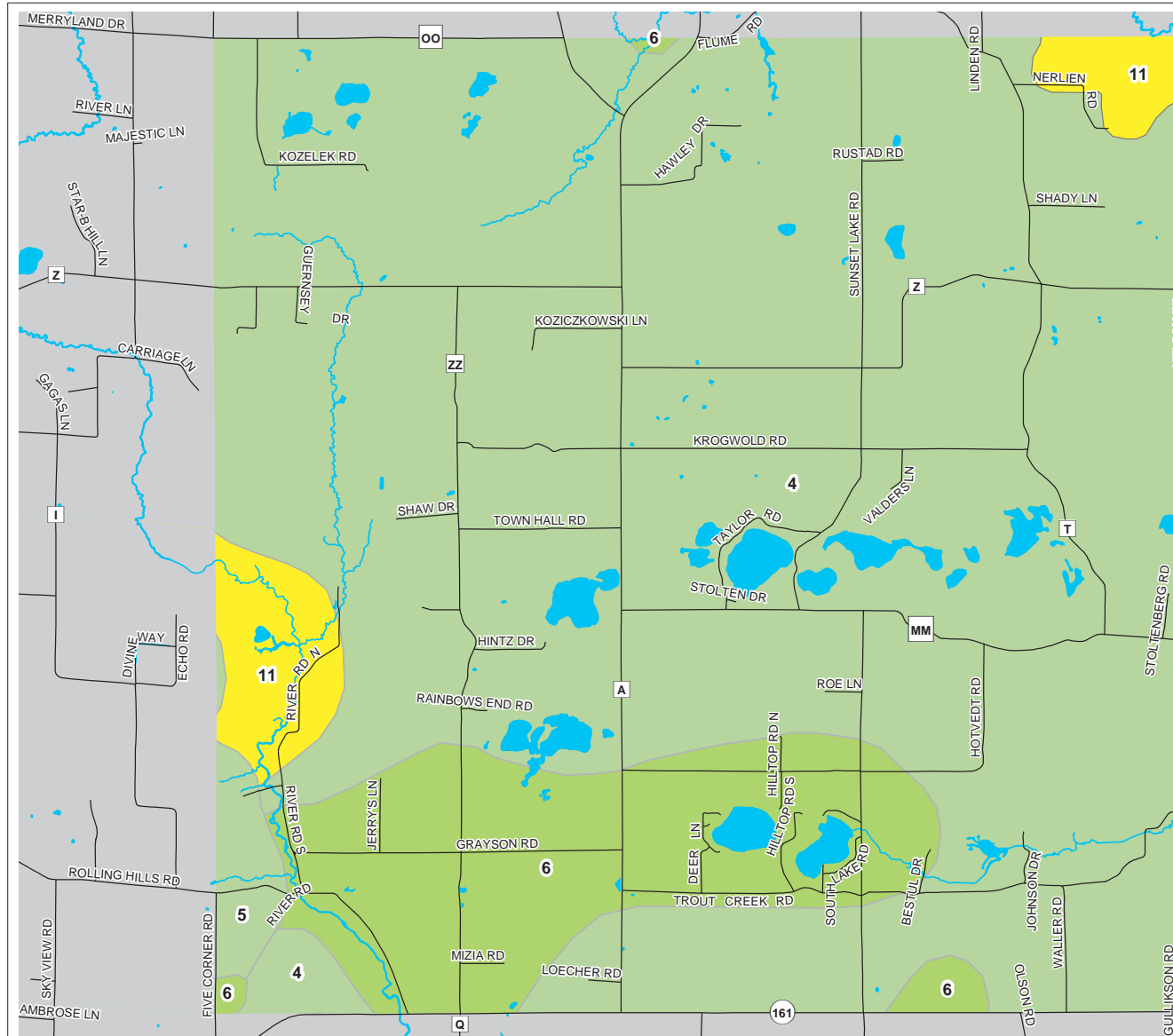


Figure 4: Soil Map of the Town of New Hope



Map 5.3 General Soil Associations

Soil Associations

Soils formed in loamy or silty materials and the underlying residuum from bedrock

- 1 Kert-Norgo Variant Association
- 2 Meadland-Rozellville-Dolph Association
- 3 Point-Dancy-Mosinee Association

Soils formed in sandy glacial drift

- 4 Wyocena-Rosholt Association
- 5 Kranski-Coloma-Mecan Association

Soils formed mainly in outwash sand and gravel or sand

- 6 Richford-Rosholt-Billet Association
- 7 Plainfield-Friendship Association
- 8 Leola-Pearl Association
- 9 Roscommon-Meehan-Markey Association

Soils formed in alluvial or organic deposits

- 10 Alluvial Land, Wet-Dunnville Association
- 11 Markey-Seelyeville-Cathro Association



0 0.25 0.5 1 Miles

Source: Portage County Planning & Zoning (2017)
U.S.D.A. Soil Conservation Service (1977)

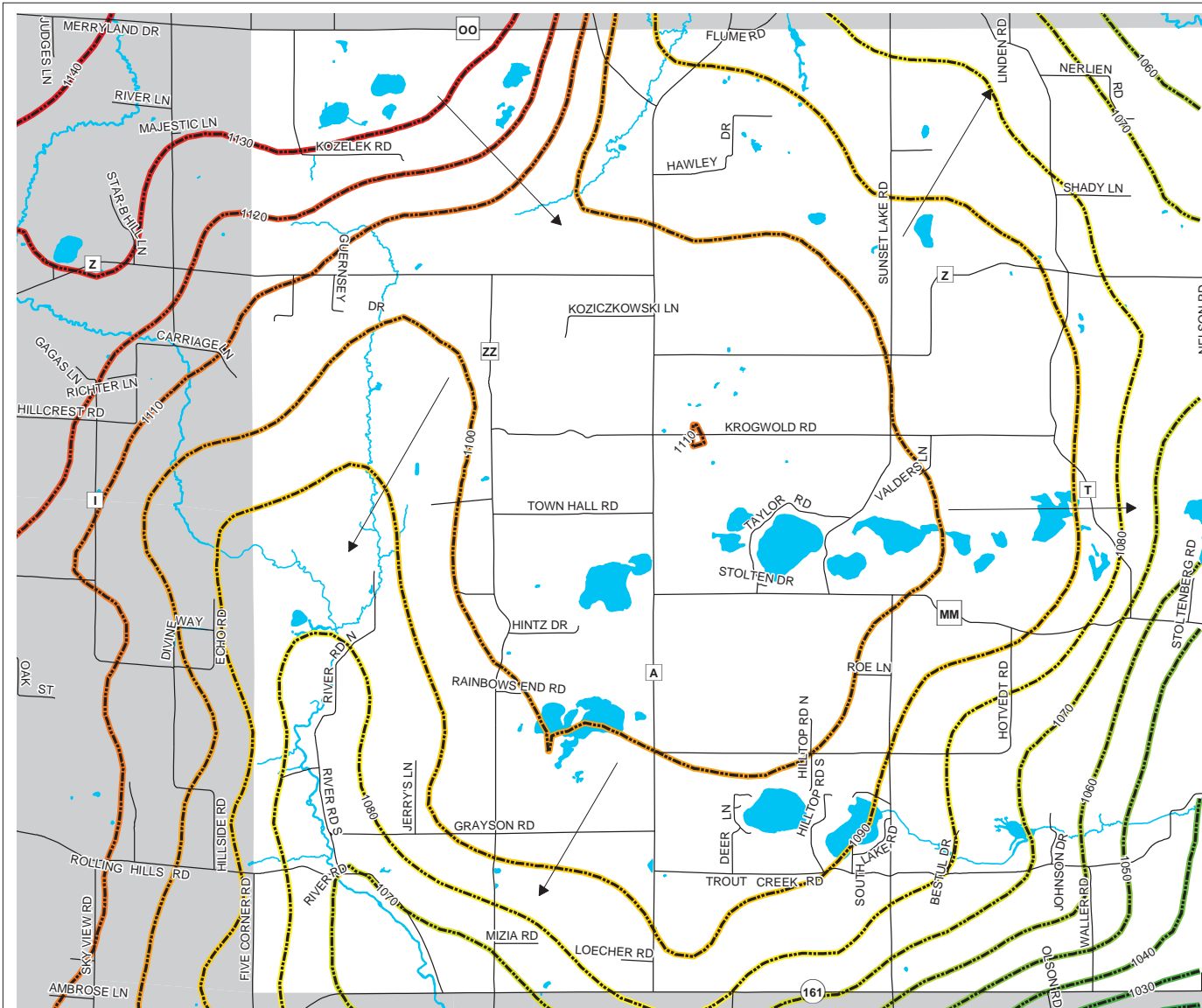
Town Board Adopted: October 24, 2017
County Board Adopted: December 19, 2017

Town of New Hope Comprehensive Plan



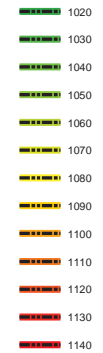
Portage County
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1462 Strongs Ave.
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Figure 5: Water Table Contour
Map of the Town of New Hope



Map 5.6 Groundwater Flow

Groundwater Elevation (Ft)



← Flow Direction



0 0.25 0.5 1 Miles

Source: Portage County Planning & Zoning (2017)

Town Board Adopted: October 24, 2017
County Board Adopted: December 19, 2017

Town of New Hope Comprehensive Plan



Portage County
Planning & Zoning
1462 Strongs Ave.
Stevens Point, WI 54481

Figure 6: 2020 Surface Water Elevations and Water Flow Map

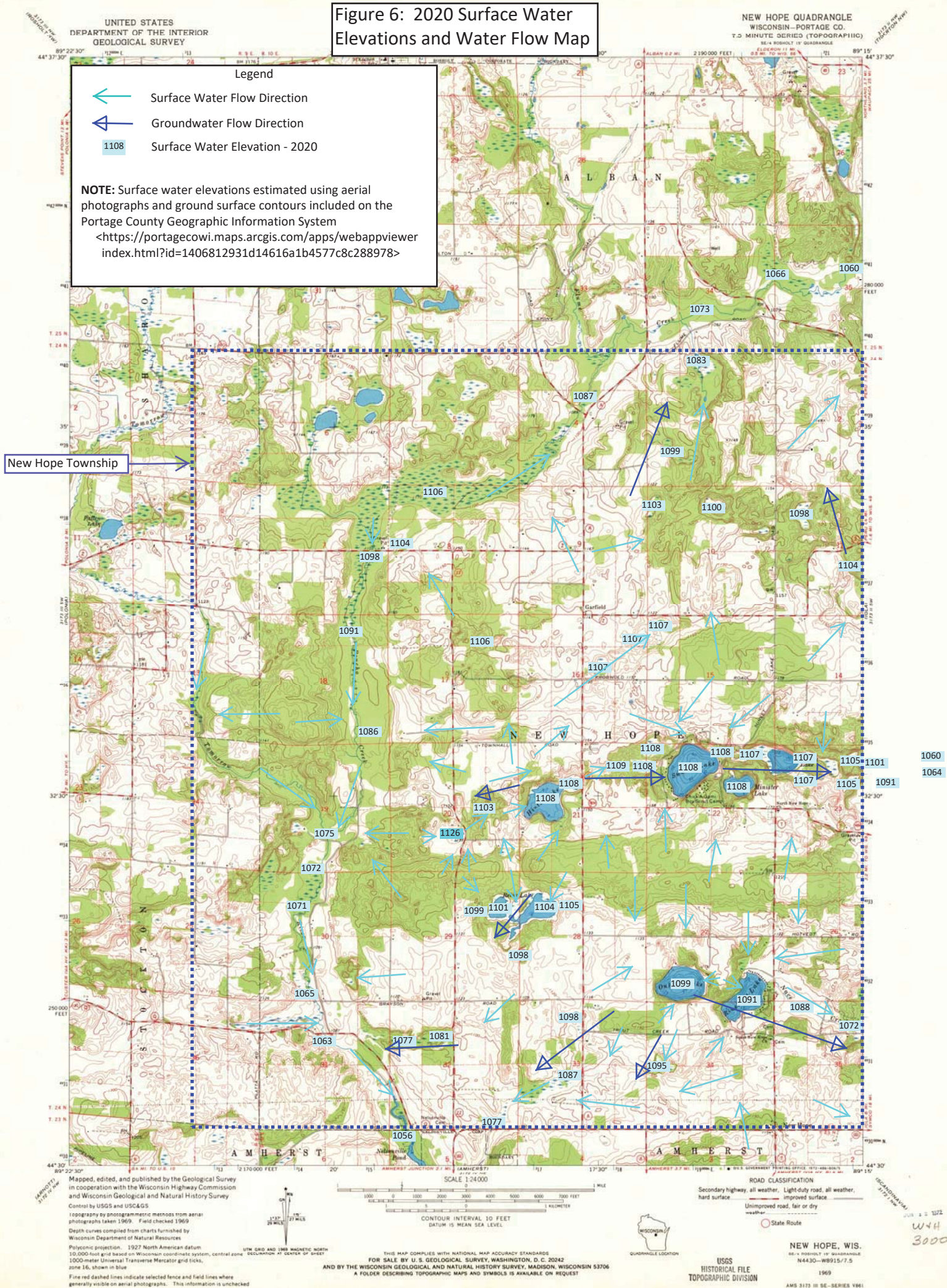




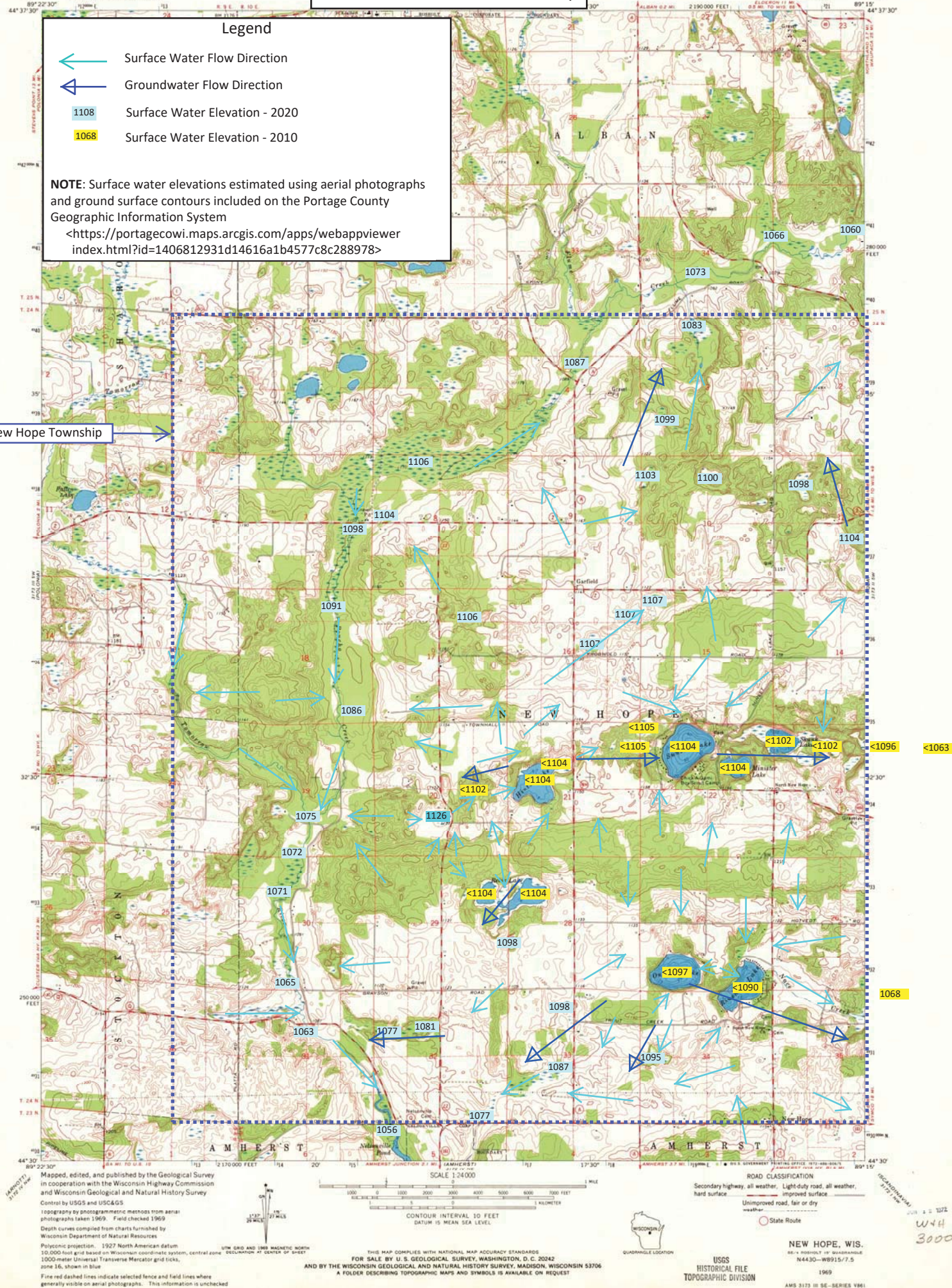
Figure 7: 2010 Surface Water
Elevations and Water Flow Map

- Legend**
-  Surface Water Flow Direction
 -  Groundwater Flow Direction
 - 1108 Surface Water Elevation - 2020
 - 1068 Surface Water Elevation - 2010

NOTE: Surface water elevations estimated using aerial photographs and ground surface contours included on the Portage County Geographic Information System

<<https://portagecowi.maps.arcgis.com/apps/webappviewer/index.html?id=1406812931d14616a1b4577c8c288978>>

New Hope Township



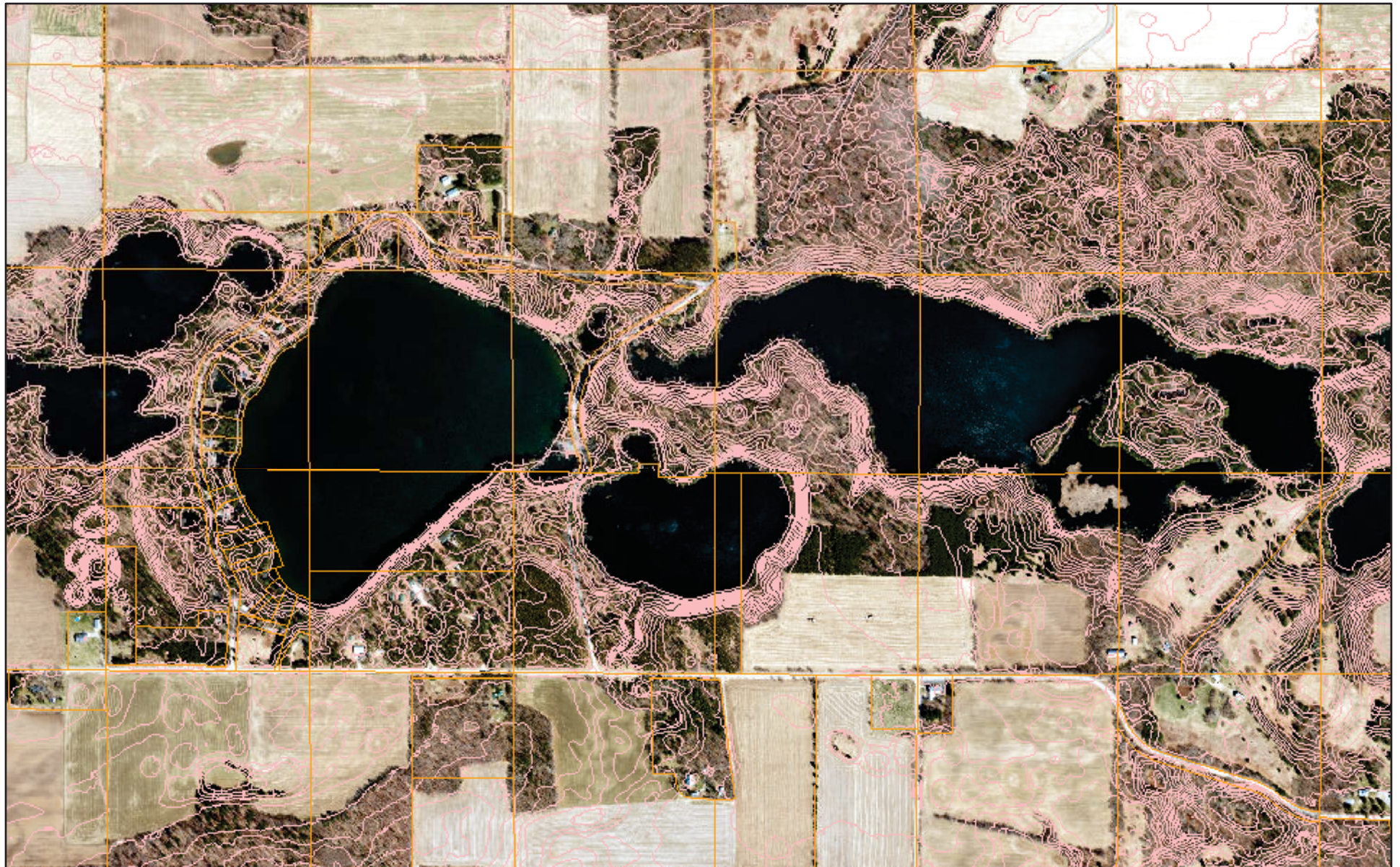
Mapped, edited, and published by the Geological Survey in cooperation with the Wisconsin Highway Commission and Wisconsin Geological and Natural History Survey. Control by USGS and USG&S. Topography by photogrammetric methods from aerial photographs taken 1969. Field checked 1969. Depth curves compiled from charts furnished by Wisconsin Department of Natural Resources. Polyconic projection. 1927 North American datum. 10,000-foot grid based on Wisconsin coordinate system, central zone. 1000-meter Universal Transverse Mercator grid ticks, zone 16, shown in blue. Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked.

SCALE 1:24,000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C. 20542
AND BY THE WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY, MADISON, WISCONSIN 53706
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Secondary highway, all weather, Light-duty road, all weather, hard surface
Unimproved road, fair or dry
weather
State Route
NEW HOPE, WIS.
1969
AMS 3173 III SE-SERIES 7861

W44
3000

Figure 8: 2020 Aerial Photograph and Surface Contours near Sunset, Minister, and Skunk Lakes



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Parcel Numbers 5 ft contours Index Depression
Parcel Boundaries Index Municipal Boundary

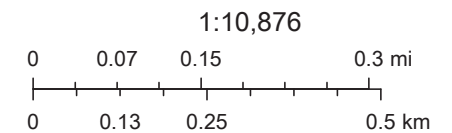
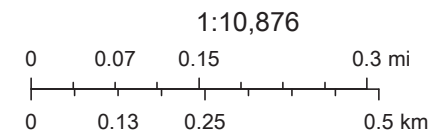


Figure 9: 2010 Aerial Photograph and Surface Contours near Sunset, Minister, and Skunk Lakes



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Parcel Numbers 5 ft contours Index Depression
 Parcel Boundaries Index Municipal Boundary



Weather Data

WETS Station: STEVENS POINT, WI
Requested years: 1971 - 2000

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	23.2	5.3	14.2	1.11	0.66	1.34	4	11.4
Feb	29.1	10.2	19.6	0.98	0.55	1.2	3	7.8
Mar	40	21.3	30.7	1.95	1.17	2.37	5	7.1
Apr	55.1	33.8	44.4	2.87	2.03	3.4	7	1.9
May	68.4	45.4	56.9	3.63	2.6	4.29	7	0
Jun	76.9	54.5	65.7	3.66	2.35	4.4	7	0
Jul	80.7	59.4	70.1	4.12	2.89	4.89	7	0
Aug	78.4	57.5	67.9	4.11	3.12	4.79	7	0
Sep	69.7	48.7	59.2	3.78	2.33	4.58	7	0
Oct	57.8	37.8	47.8	2.31	1.44	2.79	5	0.1
Nov	41.4	25.2	33.3	2.27	1.14	2.77	5	4.6
Dec	27.9	11.8	19.8	1.35	0.8	1.65	4	11.3
Annual:					29.9	34.53		
Average	54.1	34.2	44.1	-	-	-	-	-
Total	-	-	-	32.14			69	44.3

GROWING SEASON DATES

Years with missing data 24 deg = 0 28 deg = 0 32 deg = 0

Years with no occurrence 24 deg = 0 28 deg = 0 32 deg = 0

Data years used: 24 deg = 30 28 deg = 30 32 deg = 30

Probability 24 F or high 28 F or high 32 F or higher

50 percent * 4/12 to 10/27: 198 days 4/23 to 10/11: 171 days 5/5 to 9/30: 148 days

70 percent * 4/8 to 11/1: 207 days 4/19 to 10/16: 180 days 5/2 to 10/3: 154 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annul	Avg (1913- 2019)	Delta Average	5-yr Delta Average
1893	MT	0.87	M1.70	3.94	2.33	1.64	2.93	1.16	3.81	2.59	M1.31	2.06	24.34	--	--	--
1894	0.89	0.25	0.95	2.93	6.08	M2.26	M0.93	1.36	1.87	2.6	M2.11	M1.40	23.63	--	--	--
1895	M1.09	M0.35	0.48	M0.89	4.65	3.76	2.11	M3.59	2.91	0.8	1.28	M0.76	22.67	--	--	--
1896	M0.67	M0.19	M0.38	M3.67	7.68	5.2	2.94	3.49	4.94	M2.38	M2.76	0.67	34.97	--	--	--
1897	1.51	M0.58	1.73	2.12	2.39	6.76	2.34	M1.72	M2.26	0.6	1.17	1.02	24.2	--	--	--
1898	0.55	1.19	0.76	M1.94	2.3	5.16	1.45	3.23	1.89	4.52	1.15	0.5	24.64	--	--	--
1899	0.9	0.9	M1.15	3.86	2.28	7.48	3.28	2.49	1.9	1.86	1.28	0.88	28.26	--	--	--
1900	0.35	0.41	M0.94	3.04	1.89	0.51	8.28	1.32	8.81	6.85	0.6	0.45	33.45	--	--	--
1901	0.73	0.7	M0.86	0.9	2.04	2.87	4.01	1.44	M3.44	4.47	0.5	0.5	22.46	--	--	--
1902	M0.60	0.7	1.1	1.32	8.16	3.16	4.04	1.82	3.03	1.37	2.59	2.27	30.16	--	--	--
1903	0.4	1.79	M2.23	M2.31	5.59	1.88	5.33	6.46	3.78	1.38	1.44	0.94	33.53	--	--	--
1904	0.16	0.98	0.85	1.72	M5.53	3.68	2.98	2.39	M1.40	5.26	0.31	M1.00	26.26	--	--	--
1905	1	0.5	0.75	1.41	4.58	9.55	3.85	6.94	2.34	1.58	1.79	1.34	35.63	--	--	--
1906	2.51	0.09	3.08	2.02	2.86	7.88	2.14	4.87	3.67	3.49	4.96	M2.20	39.77	--	--	--
1907	M2.48	0.08	1.7	2.21	2.59	M2.36	M3.04			M0.26	1.18	1.18	17.08	--	--	--
1908	0.87	M0.83	1.53	3.76	4.37	2.44	4.61	0.51	2.08	1.16	0.8	1.6	24.56	--	--	--
1909	M0.27	1.96	M0.63	M4.13	2.36			M2.16	3.84	1.56	4	2.63	23.54	--	--	--
1910	1.57	M1.11	0.06	4.82	1.37	1.11	0.94	4.28	4.61	1.6	0.82	1.5	23.79	--	--	--
1911	1.34	M0.65		0.77	5.99	2.84	4.93	5.03	5.22	6.62			33.39	--	--	--
1912								M1.85	M1.63		M0.05	2.56	6.09	--	--	--
1913	0.8	1	2.8	2.4	7.33	8.31	3.78	0.83	4.89	3.8	1.3	T	37.24	32.66	4.58	--
1914	0.8	0.33	1.75	5.03	4.66	11.47	5.07	4.45	6.95	1.4	1.25	1.2	44.36	32.66	11.70	--
1915	1.3	4.38	0.5	0.72	4.81	2.73	3.95	2.88	4.49	2	2.86	1.03	31.65	32.66	(1.01)	--
1916	1.5	M1.23	2.52	5.01	2.86	7.04	0.87	2.84	M7.30	3.77	1.8	0.25	36.99	32.66	4.33	--
1917	3.2	MT	2.3	1.83	2.27	5.65	3.05	5.5	2.8	3.7	0.5	0.15	30.95	32.66	(1.71)	3.58
1918	1.95	0.3	1.2	1.68	6.85	2.97	2.29	3.68	1.68	2.3	1.75	1.18	27.83	32.66	(4.83)	1.70
1919	1	1.99	1.8	4.31	3.77	8.4	3.5	4.05	M4.52	3.71	2.99	0.99	41.03	32.66	8.37	1.03
1920	2.07	M0.41	M3.67	2.27	2.27	5.3	2.77	3.62	1.89	1.96	3.57	2.12	31.92	32.66	(0.74)	1.09
1921	0.73	0.4	1.56	4.73	M1.93	4.44	2.48	2.46	3.44	0.91	2.5	3.27	28.85	32.66	(3.81)	(0.54)
1922	1.87	5.08	3.82	4.75	3.02	7.06	4.09	1.72	2.1	0.84	4.28	0.53	39.16	32.66	6.50	1.10
1923	1.26	M0.74	M4.88	5.35	2.15	6.51	2.68	1.33	3.62	0.54	1.08	1.87	32.01	32.66	(0.65)	1.94
1924	1.31	M1.22	5.15	7.14	4.77	3.33	4.34	7.35	2.78	0.39	2.57	1.51	41.86	32.66	9.20	2.10
1925	0.22	0.69	1.74	2.03	1.41	10.21	3.29	1.32	5.42	1.4	M0.92	1.48	30.13	32.66	(2.53)	1.74
1926	0.64	4.04	1.38	1.91	5.02	4.07	M3.08	7.44	5.28	3.36	2.32	1.24	39.78	32.66	7.12	3.93
1927	1.1	0.35	3.34	2.3	4.11	5.3	4.31	M1.16	4.62	2	2.5	1.64	32.73	32.66	0.07	2.64
1928	0.46	2.14	2.25	2.63	1.81	4.03	3.99	9.33	5.49	4.22	1.12	M1.08	38.55	32.66	5.89	3.95
1929	2.54	M0.78	2.87	5.48	2.92	4.17	2.14	1.47	M1.74	1.89	0.85	0.38	27.23	32.66	(5.43)	1.03
1930	1.4	M0.75	2.46	1.51	3.1	7.09	2.48	2.25	2.77	3.1	0.88	0.29	28.08	32.66	(4.58)	0.62
1931	0.64	1	2	1.99	1.81	5.5	1.74	2.19	6.73	2.52	3.81	1.68	31.61	32.66	(1.05)	(1.02)
1932	2.54	1.7	1.09	1.99	3.32	4.1	2.53	1.35	1.43	1.1	2.11	1.7	24.96	32.66	(7.70)	(2.57)
1933	1.92	1.16	2.71	2.94	6.2	2.53	2.07	2.11	2.29	1.76	0.58	0.43	26.7	32.66	(5.96)	(4.94)
1934	0.9	0.56	1.38	2.76	1.01	5.52	2.79	4.91	5.63	M0.99	5.56	0.9	32.91	32.66	0.25	(3.81)
1935	2.36	1.04	0.9	5.1	2.52	M3.59	6.69	5.66	2.6	1.4	1.52	1.18	34.56	32.66	1.90	(2.51)
1936	0.86	1.23	2.06	1.18	2.7	2.12	0.37	4.91	2.86	3.55	0.86	2.17	24.87	32.66	(7.79)	(3.86)
1937	M2.01	1.62	0.48	3.02	3.88	3.26	3.76	1.82	2.88	3.82	1.94	1.27	29.76	32.66	(2.90)	(2.90)
1938	1.86	3.56	2.85	M3.30	7.13	7.18	M2.54	8.33	10.61	0.83	M2.05	M1.89	52.13	32.66	19.47	2.19
1939	1.99	1.68	1.04	2.28	1.54	5.14	2.44	2.95	4.12	1.66	0.44	0.78	26.06	32.66	(6.60)	0.82
1940	2.04	0.94	M1.73	2.05	4.61	11.29	1.86	4.68	1.59	2.64	4.41	1.14	38.98	32.66	6.32	1.70
1941	1.1	0.71	1.03	2.99	6.56	2.98	2.01	3	5.8	5.64	1.1	2.51	35.43	32.66	2.77	3.81

1942	0.85	M1.11	1.28	2.96	8.58	5.35	M2.37	2.55	7.81	0.81	3.32	1.83	38.82	32.66	6.16	5.63
1943	2.86	0.83	2.46	2.01	7.24	4.88	0.54	6.28	1.61	3.05	1.73	T	33.49	32.66	0.83	1.90
1944	0.99	M1.21	2.29	M1.42	2.08	8.63	2.72	4.94	3.21	0.37	2.39	0.63	30.88	32.66	(1.78)	2.86
1945	1.33	M2.52	1.19	3.82	6.35	4.44	2.94	4.57	2.5	0.69	7.25	2.47	40.07	32.66	7.41	3.08
1946	1.5	M0.99	1.57	1.1	3.61	5.73	1.13	1.03	6.97	2	M1.99	1.18	28.8	32.66	(3.86)	1.75
1947	M1.95	0.18	1.4	3.39	3.17	4.43	1.7	7.29	3.28	1.55	1.49	1.36	31.19	32.66	(1.47)	0.23
1948	0.69	1.38	1.69	1.81	1.89	2.49	3.16	0.91	1.4	1.33	2.35	1.43	20.53	32.66	(12.13)	(2.36)
1949	2.18	0.37	1.96	3.47	1.25	4.82	5.47	1.44	1.63	1.6	1.18	1.32	26.69	32.66	(5.97)	(3.20)
1950	3.27	1	3.45	3.32	1.89	3.46	3.91	3.2	2.2	0.78	M0.75	2.03	29.26	32.66	(3.40)	(5.36)
1951	0.56	1.37	3.69	3.92	2.92	4.23	4.61	2.78	2.75	4.52	1.56	1.31	34.22	32.66	1.56	(4.28)
1952	2.07	1.05	1.91	0.48	2.94	4.89	4.41	4.49	0.62	0.03	1.56	1.04	25.49	32.66	(7.17)	(5.42)
1953	1.05	3.2	M1.07	3.72	2.07	4.73	3.43	3.46	0.87	0.46	1.86	2.24	28.16	32.66	(4.50)	(3.89)
1954	0.59	1.31	1.4	5.01	4.69	5.84	3.3	3.28	6.71	5.75	0.97	0.49	39.34	32.66	6.68	(1.36)
1955	0.34	1.2	1.15	3.08	4.28	2.88	3.18	2.12	1.26	4.49	1.04	0.87	25.89	32.66	(6.77)	(2.04)
1956	0.53	0.5	2.26	1.81	3.52	3.75	5.31	3.04	2.26	0.67	2.9	0.79	27.34	32.66	(5.32)	(3.41)
1957	0.29	0.53	1.04	3.76	4.44	2.9	3.65	2.47	2.88	1.01	3.59	0.8	27.36	32.66	(5.30)	(3.04)
1958	0.19	0.08	0.42	2.68	1.65	3.09	2.61	4.49	4.25	1.71	2.17	0.16	23.5	32.66	(9.16)	(3.97)
1959	0.74	1.94	2.45	1.85	4.04	1.94	3.47	6.77	5.59	4.59	1.32	2.44	37.14	32.66	4.48	(4.41)
1960	1.35	0.44	0.12	3.36	5.38	3.4	1.08	3.92	3.67	2.39	1.2	0.38	26.69	32.66	(5.97)	(4.25)
1961	0.2	1.38	3.48	2.41	1.97	2.92	5.24	5.82	4.25	2.84	3.26	1	34.77	32.66	2.11	(2.77)
1962	0.48	1.35	1.09	2.59	3.79	4.64	2.33	5.1	3.19	3.37	0.29	0.91	29.13	32.66	(3.53)	(2.41)
1963	0.41	0.48	3.16	2.06	3.61	2.38	3.57	1.84	3.63	1.16	1.51	0.62	24.43	32.66	(8.23)	(2.23)
1964	0.68	0.08	1.07	2.47	3.59	2.26	7.76	3.45	6.17	0.37	2.21	0.93	31.04	32.66	(1.62)	(3.45)
1965	0.42	0.95	2.09	4	4.42	2.31	3.46	6.05	8.35	1.17	3.29	2.84	39.35	32.66	6.69	(0.91)
1966	0.95	1.6	4.84	1.48	1.07	3.4	2.14	3.55	1.59	1.02	1.38	1.63	24.65	32.66	(8.01)	(2.94)
1967	2.97	0.98	1.09	3.98	1.8	7.02	1.11	3.82	1.88	3.65	0.88	0.86	30.04	32.66	(2.62)	(2.76)
1968	0.93	0.29	1.05	3.91	5.3	6.76	3.59	1.92	5.83	1.99	0.97	2.63	35.17	32.66	2.51	(0.61)
1969	2.77	0.13	0.98	2.88	6.69	7.31	2.6	0.88	3.55	3.56	0.8	1.46	33.61	32.66	0.95	(0.09)
1970	0.63	0.19	1.47	1.16	8.31	2.17	6.64	1.62	5.09	3.84	2.34	1.24	34.7	32.66	2.04	(1.02)
1971	1.92	2.42	0.86	1.29	3.08	2.11	6.95	2.77	2.96	4.1	3.03	2.51	34	32.66	1.34	0.85
1972	0.84	0.81	2.29	1.71	1.6	1.46	3.78	7.27	7.02	1.61	1.32	2.66	32.37	32.66	(0.29)	1.31
1973	0.67	0.96	4.35	4.58	8.13	3.73	3.02	2.88	5.25	2.08	1.32	1.71	38.68	32.66	6.02	2.01
1974	0.37	0.92	2.52	2.99	3.14	2.39	4.12	3.09	1.6	1.44	1.6	1.51	25.69	32.66	(6.97)	0.43
1975	0.89	1.16	2.36	3.39	1.89	3.28	1.41	6.32	2.76	0.32	3.09	1.68	28.55	32.66	(4.11)	(0.80)
1976	1.1	1.65	2.83	3.71	2.37	1.58	4.71	1.6	0.69	0.87	0.04	0.46	21.61	32.66	(11.05)	(3.28)
1977	0.45	1.39	3.3	3.3	5.94	3.2	2.5	2.91	5.46	2.28	3.69	1.97	36.39	32.66	3.73	(2.47)
1978	0.61	0.19	0.29	4.29	3.11	4.15	6.84	3.5	4.36	1.69	2.22	0.73	31.98	32.66	(0.68)	(3.81)
1979	1.29	1.48	3.96	1.41	4.53	3.6	4.7	3.97	0.2	4.44	2.54	0.62	32.74	32.66	0.08	(2.40)
1980	2.79	0.36	1.08	2.32	3.16	3.55	2.27	8.58	6.85	2.02	0.24	0.73	33.95	32.66	1.29	(1.32)
1981	0.06	2.79	0.42	5.27	1.2	3.49	3.45	3.36	3.12	3.26	0.57	0.89	27.88	32.66	(4.78)	(0.07)
1982	1.56	0.23	1.72	3.78	3.35	1.95	8.68	2.72	3.39	2.62	4.19	2.99	37.18	32.66	4.52	0.09
1983	1.1	1.88	1.5	1.33	4.29	1.42	2.72	5.05	5.16	2.98	3.22	1.49	32.14	32.66	(0.52)	0.12
1984	0.65	1.72	1.41	3.88	2.45	6.34	4.79	6.46	5.07	5.63	4.27	2.2	44.87	32.66	12.21	2.55
1985	0.6	1.2	3.09	1.48	3.68	2.41	2.39	4.64	4.86	1.96	5.07	1.91	33.29	32.66	0.63	2.41
1986	0.46	1.02	1.9	2.48	3.39	3.3	5.73	3.76	8.33	2.57	1.23	0.44	34.61	32.66	1.95	3.76
1987	0.68	0.07	2.18	2.06	1.99	4.14	4.55	2.59	3.92	1.38	2.91	1.83	28.3	32.66	(4.36)	1.98
1988	1.38	0.3	1.85	2.51	1.25	0.94	3.54	4.4	3.82	1.79	2.48	M0.78	25.04	32.66	(7.62)	0.56
1989	0.42	0.53	2.43	0.71	8.52	1.27	2.48	3.68	3.23	4.12	1.27	0.32	28.98	32.66	(3.68)	(2.61)
1990	1.11	0.63	2.86	2.28	4.25	6.46	2.82	4.72	3.23	2	0.83	2.17	33.36	32.66	0.70	(2.60)
1991	0.61	0.8	2.02	4.16	5.27	1.38	3.23	2.21	3.34	2.31	5.2	1.77	32.3	32.66	(0.36)	(3.06)
1992	0.72	0.85	2.78	2.68	3.44	1.78	3.84	3.89	7.82	1.19	4.74	2.54	36.27	32.66	3.61	(1.47)
1993	1.35	0.28	0.55	4.82	6.37	7.59	4.56	3.54	3.38	2.03	1.78	0.33	36.58	32.66	3.92	0.84
1994	1.39	0.98	M0.51	4.25	1.85	3.61	7.42	3.84	3.06	1.96	2.51	0.27	31.65	32.66	(1.01)	1.37
1995	0.6	0.42	1.72	2.65	4.07	1.85	2.82	8.91	2.26	4.68	2.17	0.78	32.93	32.66	0.27	1.29
1996	2.7	0.98	1.35	3.32	2.52	5.91	4.38	2.34	1.78	2.72	1.36	M1.79	31.15	32.66	(1.51)	1.06
1997	1.68	0.58	1.88	M0.66	3.29	4.68	4.54	2.59	3.55	2.22	0.22	0.59	26.48	32.66	(6.18)	(0.90)
1998	1.63	1.18	2.61	1.73	2.83	8.7	0.84	3.7	1.06	1.66	1.52	0.46	28.92	32.66	(3.74)	(2.43)
1999	1.9	0.97	0.19	3.93	3.86	4.36	8.66	3.02	0.99	1.12	1.4	0.55	30.95	32.66	(1.71)	(2.57)
2000	1.64	M0.69	1.8	3.14	3.99	9.04	1.78	5.02	3.95	0.17	2.05	1.39	34.66	32.66	2.00	(2.23)
2001	0.86	1.19	0.59	4.18	4.91	6.76	2.23	3.13	5.04	2.31	1.81	0.91	33.92	32.66	1.26	(1.67)
2002	0.31	2.44	3	3.97	2.63	9.38	3.12	4.75	4.23	4.8	0.1	0.21	38.94	32.66	6.28	0.82
2003	0.53	0.79	1.87	3.1	3.77	5.25	1.98	2.44	3.19	1.26	2.68	1.18	28.04	32.66	(4.62)	0.64
2004	0.93	1.55	3.72	1.26	8.76	6.87	2.17	2	1.48	3.8	1.7	1.69	35.93	32.66	3.27	1.64
2005	1.45	1.1	1.05	1.91	2.55	5.04	2.52	4.54	5.7	1.18	2.64	0.74	30.42	32.66	(2.24)	0.79
2006	1.07	0.99	1.08	2.27	5.51	2.18	3.16	3.5	3.01	1.87	1.35	2.61	28.6	32.66	(4.06)	(0.27)
2007	1.12	1.2	1.94	2.24	2.82	2.87	3.62	5.73	2.45	3.08	0.05	2.52	29.64	32.66	(3.02)	(2.13)
2008	1.39	1.63	0.75	6.1	3.74	4.36	3.97	0.52	1.82	1.81	1.21	2.77	30.07	32.66	(2.59)	(1.73)
2009	0.68	0.8	2.21	3.45	3.27	2.84	2.14	6.19	0.36	6.37	1.13	2.32	31.76	32.66	(0.90)	(2.56)
2010	M0.23	0.57	0.65	2.32	3.53	5.29	9.43	3.93	10.18	2.02	2.16	1.64	41.95	32.66	9.29	(0.25)
2011	0.83	1.28	2.25	4.26	2.52	3.34	9.19	2.18	4.3	1.53	1.89	1.33	34.9	32.66	2.24	1.01
2012	0.98	1.24	1.83	2.74	4.54	2.24	0.68	3.37	2.11	5.07	1.28	1.84	27.92	32.66	(4.74)	0.66
2013	1.63	1.55	1.72	4.17	4.52	4.43	2.39	2.45	1.8	3.19	2.31	1.35	31.51	32.66	(1.15)	0.95
2014	1.33	1.17	1.07	5.74	4.21	4.65	1.54	7.38	2.8	3.09	2.06	1.41	36.45	32.66	3.79	1.89
2015	0.63	0.28	0.47	2.48	5.17	4.92	4.76	6.22	5.44	2.53	2.74	5.12	40.76	32.66	8.10	1.65
2016	0.91	0.91	5.39	1.51	2.61	6.5	4.94	3.71	5.33	2.04	2.09	2.63	38.57	32.66	5.91	2.38
2017	2.37	1.21	2.25	5.07	4.91	7.6	1.96	3.7	2.69	4.24	0.54	1.16	37.7	32.66	5.04	4.34
2018	1.03	1.25	0.88	5.42	4.87	5.18	3	4.35	4.18	5.24	1.83	1.17	38.4	32.66	5.74	5.72
2019	1.78	3.3	2.07	4	5.33	3.79	6.63	2.59	7.46	3.58	1.92	2.91	45.36	32.66	12.70	7.