

**MINNESOTA POWER ST LOUIS RIVER PROJECT FERC 2360
ISLAND LAKE RESERVOIR TECHNICAL COMMITTEE MEETING SUMMARY**

MEETING DATE & PLACE, E-MAIL OR CONFERENCE CALL	ATTENDEES	INFORMATION REVIEWED	SUMMARY OF RESERVOIR. CLIMATOLOGICAL & HYDROLOGICAL CONDITIONS	DECISIONS AND ACTION TAKEN
Island Lake Reservoir Technical Committee Mid-Winter Drawdown Meeting– held virtually via email dated February 24, 2016		-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir operation data – current and multi-year	Reservoir Status – 1363.03 feet Precipitation – Above normal since October 2015 Temperatures – Above normal Drought / Soil Conditions –Exceptionally wet soils, normal to above normal water in snowpack Weather Outlook – Above normal temperatures and below normal precipitation Hydrologic Outlook – well above average chance of refill - 88% chance of refill for normal operation and 96% under dry condition operation.	Operate under normal condition operating parameters.
Island Lake Reservoir Technical Committee Pre-Winter Drawdown Meeting Monday, November 30, 2015 Web-ex and GOB Rm. 140 – 10:00 a.m.	MP (6) DNR (3) NWS (1) Downstream (1) Island (1) Other (0)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir operation data – current and multi-year	Reservoir Status – 1368.78 feet Precipitation – Heavy rain in Aug and Sept ended drought Temperatures – Temperatures have been around normal Drought / Soil Conditions – very high but no snow Weather Outlook – Below normal precipitation and above normal temps, El Nino - main driver behind long term weather outlooks Hydrologic Outlook – 70% chance of refill for normal operation (63 years of historical data and <u>not</u> considering El Nino) and 90% under dry condition operation. (Compare to historical perspective of 62% under normal and 83% under dry)	Normal conditions declared. Operate under normal condition operating parameters. If conditions remain normal, the mid-winter meeting will be held via email.
Island Lake Reservoir Technical Committee Mid-Winter Drawdown Meeting Friday, February 20, 2015 Videoconference – 9:30 a.m.	MP (6) DNR (3) NWS (2) Downstream (1) Island (3) Other (0)	NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir operation data – current and multi-year	Reservoir Status – 1362.31 feet Precipitation – Slightly below normal for the past 6 months Temperatures – Temperatures have been around normal Drought / Soil Conditions – Slight degradation to D0 Short Range outlook – Nothing spectacular either way Longer Range – No strong indicators to forecast above or below normal temperatures or precipitation Hydrologic Outlook – Confidence is lower than average for successful fill in normal (15%) operating conditions; somewhat more confident (55%) at dry operating conditions	Operate under Normal Conditions with a one foot reduction in drawdown
Winter Drawdown Meeting Tuesday, January 6, 2015 Thomson City Hall, 33 Dalles Ave, Carlton, Minnesota 10:00 a.m. – 12:00 p.m.	MP (8) DNR (3) NWS (1) Downstream (1) Island (2) Other (0)	NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Drawdown started on November 13 at 1367.13 (36.82), 1.68 feet below full pond Precipitation – Slightly below normal for the past 6 months Temperatures – Temperatures have been around normal. Drought / Soil Conditions – Slight degradation to D0 Short Range outlook (Jan) – Nothing spectacular either way Longer Range – No strong indicators to forecast above or below normal temperatures or precipitation Hydrologic Outlook – Confidence is lower than average for successful fill in normal (20-30%) operating conditions; much more confident (65%) at dry operating conditions	Operate under Normal Conditions with a one foot reduction in drawdown to be reassessed on or before February 20 meeting.
Spring Refill Meeting – held virtually via email dated May 29, 2014		-NWS Current and Forecasted Weather Conditions -Reservoir Operation data – current and multi-year	Reservoir full Precipitation – Precipitation was well above normal for the season, leading to high water levels on area lakes and streams but little flooding. Temperatures – Persistent cold Winter Season; early deep snow resulted in relatively shallow frost depth; snow and soil frost issues have ended. Drought / Soil Conditions – Drought conditions have ended for the area, currently normal; soil moisture from 125 to 175 percent of normal for all depths Short Range outlook (June) – Continued cool. Longer Range – Temperatures look colder than normal through the summer; possibly drier than normal early in the summer. Next Winter – looking more likely that El Nino conditions will form, leading to warmer than normal temps, no strong precipitation signal	-Operate under Normal Conditions
Mid-winter Drawdown Meeting – held virtually via email dated February 24, 2014		-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Precipitation –Precipitation is above normal in the basin since October 1; 4 to 6 inches of snow water equivalent on the ground. Temperatures – Persistent cold Winter Season; early deep snow resulted in relatively shallow frost depth. Drought / Soil Conditions – Continue to improve over last year, now considered no drought in the area Short Range outlook (Feb) – Continued C. O. L. D. Longer Range – Temperatures look colder than normal through the spring; Little hint on precipitation Hydrologic Outlook – Confidence is much higher than average for successful fill in either normal (95+%) or dry (98%) operating conditions	-Operate under Normal Conditions

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Pre-Winter Drawdown Meeting Monday, December 9, 2013 Thomson City Hall, 33 Dalles Ave, Carlton, Minnesota 11:30 p.m. – 1:00 p.m.	MP (9) DNR (1) NWS (2) Downstream (1) Island (2) Other (1)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year -Remote monitoring update	Reservoir Status – Drawdown started on November 20 at 1368.35 (38.04), 1.46 feet below full pond Precipitation – August – September dry led to return to D0 Drought Status. However precipitation is above normal in the basin since October 1 and 2 to 3 inches of S.W.E on the ground. Temperatures – Hot August (14 days above 80 deg) and warm September. Temperatures tipped basin back into D0. Drought / Soil Conditions – Improved over last year (D2 improved to D0) Short Range outlook (Dec) – C. O. L. D. with a bit of snow, especially early Longer Range – No strong indicators to forecast above or below normal temperatures or precipitation Hydrologic Outlook – Confidence is higher than average for successful fill in either normal (70%) or dry (90+) operating conditions. (Compare to historical perspective of 62% under normal and 83% under dry)	-Operate under Normal Conditions
Email correspondence 5/13/13		Normal Condition and Dry Condition Operating Plans	Clarification was needed about when to revert back to the Normal Condition Operating Plan. Per Deserae Hendrickson DNR email dated 5-6-13, clarification was provided and will be followed. The formal update to the wording in the Operating Plan will be discussed at the next meeting.	1) If US Drought Monitor indicates the watershed is still in drought status (D0 or higher), then you proceed with Q95 flows (even if you cross over the normal refill curve) until you achieve a reservoir elevation of 37.5, at which time you revert back to normal minimum flows. 2) If we are no longer in drought status or drop out of drought status, and you reach or exceed the Normal Refill Curve, then you should revert back to normal minimum flows (even if you are below the 37.5 elevation). 3) If you achieve the 37.5 elevation, you automatically revert back to normal minimum flows (regardless of drought conditions).
Spring Refill Meeting Friday April 5, 2013 Thomson City Hall, 33 Dalles Ave, Carlton, Minnesota 12:00 p.m. – 2:00 p.m.	MP (9) DNR (4) NWS (2) Downstream (2) Island (5) Other (1)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Drawdown ended and waiting for refill – elevation on 4/3/13 = 1360.78 (30.47) Precipitation – Since July conditions have been dry. While we have seen some events this winter, still below normal from a longer multi-seasonal perspective. Temperatures – For Oct through Early April, average temperatures Below Normal Soil Conditions – Dry across the entire basin. Moderate (D1) to Severe Drought (D2). Short Range outlook (Through Mid Apr) – Normal to above normal Precipitation with Normal to Below Normal Temperatures For Apr through Jun – Broader 3 month climate outlook – Equal Chances of above or below normal precipitation. Equal chances of above or below normal temperatures. NWS Model Chance of Refill – 45% chance of refill by June 1 under normal operating plan and 95% chance under dry condition operating plan. (Compare to historical perspective of 62% under normal and 83% under dry)	-Dry conditions continue. Operate under the Dry Condition Operating Plan – discharge set to Q95 minimum flow.
Island Lake Reservoir Technical Committee Mid-Winter Drawdown Meeting Wednesday, February 13, 2013 Videoconference – 10:00 a.m.	MP (10) DNR (5) NWS (2) Downstream (1) Island (3)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Current Elevation 1363.81 (33.50) Precipitation – Conditions since July have been dry Temperature – For Oct. through Feb 9, average temp around normal Soil Condition – Dry across entire basin. Severe drought – D2 status Short Range Outlook (Feb) – Slightly above normal precip with below normal temps Longer Range Outlook – Above normal precip and equal chances for temps NWS Model Chance of Refill – 38% chance of refill by June 1 under normal operating plan and 80% chance under dry condition operating plan. (Compare to historical perspective of 60% under normal and 80% under dry)	-Dry conditions continue so continue to operate under Dry Condition Operating Plan with a 2.5 feet maximum reduction in the drawdown target. Drawdown target for April 1 is 1360.61' (30.30').
Island Lake Reservoir Technical Committee Pre-Winter Drawdown Meeting Tuesday, December 18, 2012 – 1:00 p.m. Thomson City Hall	MP (5) DNR (4) NWS (2) Downstream (2) Island (6) Other (1)	- NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Drawdown started 12/7/12 at 1366.43' (2.38' below full) Precipitation – Wet through June. Very dry this fall and very little snowpack now in place. Temperatures – Average temperatures have been above average. Soil Conditions – Dry across the entire basin. Severe Drought – D2 status. Short Range outlook (Dec) – Equal Chances - no strong indication For Jan – Apr – Equal chances of above or below normal precipitation, Below normal to normal temperatures. NWS Model Chance of Refill – 30% under Normal Condition Operating Plan and 65% under Dry Condition Operating Plan. (Compare to historical perspective of 60% under normal and 80% under dry)	-Dry Condition declared. -Operate under Dry Condition Operating Plan with a 2.5 feet drawdown reduction. Therefore drawdown target for April 1 is 1360.61' (30.30'). -Next meeting will be in February.
Spring Refill Meeting Thursday, May 31, 2012	MP (4) DNR (3) NWS (1) Hunter (1) Bowman (1) Island (5)	-NWS Current and Forecasted Weather Conditions -Reservoir Operation data – current and multi-year -Letters of interest from Island Lake Reservoir residents to become formal committee members	Reservoir Status – Reservoir reached full 1368.81 on May 31, 2012 Precipitation – Pattern shifted to a very wet pattern in late April/May. Well above normal rains for May Temperature – Mild with above average readings Soil Condition – now wet – Drought Monitor shows improvement Short Range outlook (June) – Equal Chances of above or below normal temperatures and precipitation. For June through Aug – Broader look CPC – Equal chances of above or below normal temperatures and precipitation. Canadians indicating below normal precipitation and temperatures.	-Operate under Normal Condition Operating Plan -Five of Six Island Lake Reservoir residents interested in serving on committee were in attendance. Clay Cich, Jim Ray, Roger Lindberg, and Roy Sundborn will represent the group with Matt Cich and James Schweiger as alternates. Five year review meetings will be scheduled starting in the fall.

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Mid-Winter Drawdown Meeting February 16, 2012 Thomson City Hall	MP (7) DNR (6) NWS (1) Hunter (1) Island (10) Other (1)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Drawdown started 11/21/11 at elevation 1367.29' (1.52' below full). Current Elevation 1363.63 (33.32) Precipitation – Below normal since September 2011 with above normal expected March to May Temperature – Above normal Sept 2011 to Feb 2012 with expected March to May at equal chances Soil Condition – Abnormally dry D0 to moderate D1 drought in watershed NWS Model Chance of Refill – 18% chance of refill by July 15 operating under dry conditions Other – Reviewed 2003/04 and 2006/07 drawdowns - drought was moderate D1 to severe D2, starting drawdown elevations were lower than this year, and refill was accomplished on or near June 1	-Dry Condition continues -Continue to operate under Dry Condition Operating Plan with a 2.5 feet drawdown reduction. Therefore drawdown target for April 1 is 1360.61' (30.30'). -Five year review of operating plan due to FERC in 2013 and a Committee will meet in 2012 for this review. -Next meeting will be scheduled for mid-May.
Pre-Winter Drawdown meeting December 13, 2011 Videoconference	MP (8) DNR (4) NWS (1) Bowman (1) Hunter (1) Island (10) Other (1)	-NWS Current and Forecasted Weather Conditions -NWS Refill Model -Reservoir Operation data – current and multi-year	Reservoir Status – Drawdown started 11/21/11 at elevation 1367.29' (1.52' below full) Precipitation – Below normal, 25%-50% of normal, drought conditions worsening, above normal precip expected Temperature – Above normal last few months with below normal temps expected Soil Condition – Abnormally dry to moderate D1 drought in watershed NWS Model Chance of Refill – 15% under Normal Condition Operating Plan and 50% under Dry Condition Operating Plan. (Compare to historical perspective of 60% under normal and 80% under dry) Other – Reviewed 2003/04 and 2006/07 drawdowns - drought was moderate D1 to severe D2, starting drawdown elevations were lower than this year, and refill was accomplished on or near June 1	-Dry Condition declared. -Operate under Dry Condition Operating Plan with a 2.5 feet drawdown reduction. Therefore drawdown target for April 1 is 1360.61' (30.30'). -Five year review of operating plan due to FERC in 2013 and a Committee will meet in 2012 for this review. -Next meeting will be in February.
Spring Refill Meeting Thursday, May 12, 2011 Videoconference	MP (6) DNR (4) NWS (1) Bowman (1)	NWS and State Climatology data, model output and forecasts Island Lake Reservoir YTD Operations and Multi-year elevations graphs	Summary Precipitation –For April and into the early part of May we have had slightly above normal Precipitation which is good as more water is able to run off prior to “full” green up. Inflow to Island lake peaked with snow melt and Late April precipitation. Temperatures –For April through the early part of May has been slightly below normal temperatures. Soil Conditions –slightly above normal. Wetlands are generally high and a large portion of additional future rainfall will runoff into the reservoir. Drying expected the next 7 days Short Range outlook (May) –Above Normal temperatures and below normal precipitation through May 20th. Then moving back into a wetter pattern toward the later part of the month. May –July –Below normal temperatures and no real indications either way of above or below normal precipitation.	Normal conditions declared with normal operating conditions. Mid-summer update will be emailed to group. Next meeting not yet scheduled.
Telephone call and email February 11, 2011	MP, NWS	NWS model	Discussed the NWS model inputs, as the projected 98% refill chance is well above normal refill chances (historically ~60-80%).	NWS to review projection and effect of date inputs on model accuracy.
Mid-Winter Drawdown Meeting Gov't Services Building (teleconference) February 3, 2011	MNDNR (3) MP (4) NWS (2) Bowman Lake (1) Island Lake (1)	NWS and State Climatology data, model output and forecasts. Island Lake 2004-2011 water elevation, inflow and outflow plots	Island Lk Status: Current elevation about 34.25 ft, being drawn down ~1' above curve. Discharge approximately 500 cfs from Island Lake. Precipitation: Late October and November rains brought precipitation total to slightly above normal for Duluth. Brimson still slightly below normal. Snowfall totals above normal; snow-water equivalent (SWE) at 3.7 in Brimson, 3.9 in Island Lake Temperature Status: Colder than normal in December/January (November was 2.5 degrees F higher than normal). Drought Status: Drought in the watershed ended with the late October storm. Extended Forecast: La Nina expected to produce higher precip totals than average in February, equal chances for March-April. Strong possibility of below normal temperatures February-April. Soil States: Soils in upper and lower horizons still wet, though lower zones appear to be losing some moisture Very shallow frost penetration due to coinciding snowfall and cold weather arrivals in November. Frost levels as shallow as 6" in some areas. Volume exceedance: Per NWS model - With current conditions and using normal operating guidelines the chance of refill by June 1 st is 98% provided spring precipitation is normal. With current conditions and using dry refill operating guidelines, the chance of refill to the dry refill range by July 15 th is >98%.	Normal conditions declared, with drawdown target of 27.8 by April 1. MP will continue to monitor weather conditions and re-evaluate drawdown schedule if necessary.
Pre-Winter Meeting Thomson Station December 14, 2010	MNDNR (2) MP (5) NOAA (3) Hunter Lake (1) Island Lake (4)	DNR overview of St. Louis River Project, Island Lake Technical Committee, reservoir operations, and response to drought conditions NWS and State Climatology data, model output and forecasts. Island Lake 2003-2010 water elevation, inflow and outflow plots, historical cumulative inflow to compare dry years vs. normal and	Island Lk Status: Large rain event in late October filled reservoir to within 1 foot of June 1 target elevation. Discharge met minimum flow requirement through November, until increased for winter drawdown on December 1. Precipitation: Duluth ~3 inches above normal precip for 2010, largely due to mid-May storm event. Brimson ~5 inches below normal. Mid-May storm stayed south of the watershed, so no large runoff events after early March snowmelt. Sporadic rains absorbed by vegetation, swamps and soil until late October event. Snowpack currently 12 inches with 2.3 inch snow water equivalent at Island Lake. Temperature Status: June through November generally a bit above normal, creating more evaporation. December is below normal. Drought Status: Drought in the watershed ended with the late October storm. Extended Forecast: La Nina expected to produce below normal temperatures for the next 4 months. Equal chances of wetter or drier winter. Soil States: Soil moisture is high after October rain and November snow.	Normal conditions declared, with drawdown target of 27.8 by April 1. MP will continue to monitor weather conditions and re-evaluate drawdown schedule if necessary. The next meeting is tentatively scheduled for the first week of February.

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		wet years	Volume exceedance: With current conditions and using normal operating guidelines the chance of refill by June 1 st is 87%. With current conditions and using dry refill operating guidelines, the chance of refill to the dry refill range by July 15 th is 91%.	
Spring Meeting Via teleconference May 4, 2010	MNDNR (3) MP (6) NOAA (4) Bowman Lake (1) Hunter Lake (1) Island Lake (1)	NWS and State Climatology data, model output and forecasts. Island Lake 2004-2010 water elevation, inflow and outflow plots	Island Lk Status: Approximately 4.7 feet below June 1 target elevation. D1 drought status has been declared and out flows now match inflows. Precipitation: Over 3 inches below normal precip levels for Jan 2010-May 2010. 2 nd driest April on record (for Brimson). 4 inches of water equivalent snowpack was melted in 15 days. The likelihood of refill will decrease as the summer progresses and the drought condition is expected to continue. Temperature Status: Warmest March/April on record Drought Status: Island lake is now under a D1 drought status. A portion of the watershed is under a D2 drought status. Extended Forecast: Above normal temperatures for the next 3 month period. El Nino will be weakening and is expected to be a neutral influence on weather patterns. Soil States: Soil moisture is very low throughout. Volume exceedance: With current conditions and using normal operating guidelines the chance of refill by June 1 st is 3%. With current conditions and using dry refill operating guidelines, the chance of refill to the dry refill range by July 15 th is 30%.	Dry conditions declared. Operate reservoir under dry condition refill plan with Q95 outflows (or inflow if less) until the upper dry refill curve is reached. MP will continue to monitor weather conditions and re-evaluate schedule if necessary. The MNDNR would like a status report in July via email with MP. The next meeting will be decided at that time.
Mid-Winter Meeting Via teleconference January 28, 2010	MNDNR (5) MP (5) NOAA (2) Bowman Lake (1) Hunter Lake (1)	NWS and State Climatology data, model output and forecasts. Island Lake 2004-2009 water elevation, inflow and outflow plots General conversation of how MP's operations are based on "rate of change" in reservoir elevations	Precipitation – Slightly above average December – January, high water equivalent (WE) in snowpack Temperatures – Slightly above normal December -January Short Range outlook (End of January-early February) –Normal temperatures expected, above normal precipitation Extended Forecast: – Above normal temperatures (with fairly good confidence); "equal chances" for precipitation. Soil States – Upper zones on wet side of normal, lower zones still drier than normal due to 2009 summer conditions Volume exceedance: Under normal operating conditions in an average year, the chance of refill is 60%. With current conditions and using dry condition operating guidelines, chance of refill this year is 98% by July 15 and 78% by June 1. Using normal condition operating guidelines, chance of refill this year is 70%.	With normal operating chance, we have a 10% higher than normal chance of reaching refill (70% vs. the average of 60%). Normal conditions declared, with drawdown target of 27.8 by April 1. MP will continue to monitor weather conditions and re-evaluate drawdown schedule if necessary. DNR requested a chart of discharge flows be included in next presentation. Next meeting scheduled for May 4, 2010. Meeting will be either via teleconference (Island Lake Technical Meeting only) or face-to-face (Island Lake and Winton)
Email sent by Nora Rosemore on December 15, 2009	MNDNR (4) MP (19) NOAA (3) Island Lake (6) Boulder Lake (1)	National Weather Service Presentation "Island Technical Committee Follow-Up" December 9, 2009	Precipitation – November – December was below normal within the basin. Temperatures – November was very warm then came December. Short Range outlook (2nd Half of Dec) –Near Normal Temperatures expected with Below Normal Precipitation For Jan – Apr 2010 – Above normal temperatures (with fairly good confidence); "Equal Chances" for Precipitation. Soil States – Greatest deficiency in the soil states is the lack of water equivalent within the basin. Volume exceedance: Now at 40% chance of refill	MP proposed conservative winter drawdown to proceed with target drawdown elevation at one foot above minimum drawdown elevation at least until January 28, 2010 meeting. At this time snowpack and other climatological information will be reviewed to determine Jan-April operations. Three email responses received from outside MP. Email from Island Lake (Frank Amendola) and DNR (Deserae Hendrickson) agreed with proposed plan. One email response from DNR (Ian Chisholm) asked for further information on the forecasts.
Pre-winter meeting November 18, 2009	MDNR (5) NWS (1) Bowman Lk Assoc (1) Hunter Lk (1) MP (4)	NWS and State Climatology data, model output and forecasts. Island Lake 2004-2009 water elevation, inflow and outflow plots	Island Lk status: Reservoir is at full pond and winter drawdown will commence in early December. Precipitation status: Very dry during first half of summer. Rains in August-October brought Duluth area back to near normal. Precipitation is roughly 2-8" below normal. Temperature status: May-August fairly normal; September was much above normal. October had several cool days, then not much change diurnally in later part of month. November has been warm to date. Drought status: U.S. Drought Monitor on November 10 showed parts of watershed were "Abnormally Dry" with a moderate drought in north central portion of state. U.S. Drought Monitor on November 17 showed no drought conditions in much of watershed with "Abnormally Dry" in north central portion of state. Temperature outlook: El Nino expected to continue to strengthen, with warmer than normal chances for temperature through March. Precipitation outlook: Equal chance for above, below or normal precipitation for December - March. Soil moisture model (55 yr simulation): Upper layers of soil relatively moist, with Total Water Content of Lower Zone normal. Free Water Content of Lower Zone dry but will likely increase as water filters from upper levels.. Late freeze may affect impact water movement from upper layers of soil Volume exceedance: Currently dryer than normal. Normal chances of refill are 60%; this year's chance of refill currently at 50%.	Winter drawdown has not yet occurred. Due to changing weather conditions group will hold a teleconference on December 10, 2009 to re-evaluate weather conditions, soil moisture content, and chance of refill. Conservative drawdown will occur until that time. Mid-winter meeting tentatively scheduled for January 28, 2010 @10:00 AM.
Spring Refill Meeting May 26, 2009 Via teleconference	MDNR (5) NWS (1) Bowman Lk Assoc	NWS and State Climatology data, model output and forecasts.	Island Lake status: Spring runoff started early in mid-March. June 1 st target elevation (38.5 ft) reached in early May. Precipitation status: Near normal precipitation for the water year October 2008-April 2009. Below normal from late April through early May.	Normal operating conditions were declared.

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	(1) Hunter Lk (1) MP (4)	Island Lake 2005-2009 water elevation, inflow and outflow plots	Temperature status: From October through early May, temperature was 1-2 degrees F below normal. Drought status: Area is currently in a non-drought condition. Temperature outlook: Below normal temperatures for June through August 2009. Precipitation outlook: Equal chance for above, below or normal precipitation for June through August 2009. Soil moisture model (55 yr simulation): No modeling performed. Volume exceedance: No modeling performed.	Next meeting is scheduled for sometime in November 2009. Date to be determined.
Mid-winter mtg January 29, 2009 Via teleconference	MDNR (4) Island Lk (1) NWS (3) Bowman Lk Assoc (1) MP (6)	NWS and State Climatology data, model output and forecasts. Island Lake 2005-2009 water elevation, inflow and outflow plots	Island Lake status: Drawdown on pace to reach license allowed minimum of 27.8 ft by April 1, 2009. Precipitation status: Near normal precipitation for the water year October 2008- January 2009. Drought status: Area is currently in a non-drought condition. However, a portion of the upper watershed was in the abnormally dry area as of January 20, 2009. Temperature outlook: Equal chance for above, below or normal temperatures for January through March 2009. Precipitation outlook: Equal chance for above, below or normal precipitation for January through March 2009. Soil moisture model (55 yr simulation): January simulation upper soil moisture at good levels and similar to 2008. Lower soil moisture simulation in the upper (75 th) quartile. Volume exceedance: Forecasting at this time under normal operating rules (November-April 1 st) there is approximately a 75% probability of refill to the June 1 st target elevation of 38.5 ft.	Normal operating conditions were declared. Next meeting is scheduled for May 5, 2009.
Pre-winter meeting November 21, 2008	MDNR (4) NWS (3) Bowman Lk Assoc (1) MP (6)	NWS and State Climatology data, model output and forecasts. Island Lake 2005-2008 water elevation, inflow and outflow plots	Island Lk status: Reservoir is at full pond and winter drawdown will commence in early December. Precipitation status: For 2008 water year (October 2007-September 2008), upper watershed was 0.6 to 2.1 inches below normal while Duluth area was 3.5 inches above normal. Drought status: Area is currently in a non-drought condition. However, a portion of the upper watershed was in the abnormally dry area as of November 4, 2008. Temperature outlook: Equal chance for above, below or normal temperatures for December through February Precipitation outlook: Equal chance for above, below or normal precipitation for December through February Soil moisture model (55 yr simulation): November simulation upper soil moisture at good levels and similar to 2007. Lower soil moisture simulation lower than that 2007 due to drier summer. Volume exceedance: Forecasting at this time under normal operating rules (November-April 1 st) there is approximately a 60% probability of refill to the June 1 st target elevation of 38.5 ft.	Normal operating conditions were declared. Next meeting will be held by teleconference in late January to assess precipitation received, forecasts, and modeling of refill to determine extent of drawdown.
Spring Refill Meeting April 29, 2008	MDNR (2) NWS (3) BOWMAN LK ASSOC (1) MP (6) ISLAND LK COMM (1)	NWS and State Climatology data, model output and forecasts. Island Lake 2005-2008 water elevation, inflow and outflow plots	Island Lk status: Refill is progressing well with ample run-off and should reach June 1 st target elevation by mid – May. Precipitation status: December had higher than normal precipitation, while January was much drier than average. Since October 1, 2007 precipitation is near or above normal. Drought status: Area is currently in a non-drought condition. Temperature outlook: We are in a moderate to strong La Nina event, indicating the possibility lower than average temperatures from May through June. Precipitation outlook: Forecast is for above normal precipitation in May. Soil moisture model (55 yr simulation): Higher in all zones; soils are saturated (in upper quartiles). Volume exceedance: Under normal operating rules (April 1 st -June 1 st) there is a 98% probability of refill to the June 1 st target elevation of 38.5 ft.	Normal operating conditions were declared. Next meeting date will be set in late summer or early fall.
Mid-Winter Meeting January 31, 2008	MDNR (6) NWS (3) BOWMAN LK ASSOC (1) MP (7)	NWS and State Climatology data, model output and forecasts. Flood modeling presentation by NWS; possible tool for MP Hydro Operations in the future. Island Lake 2005-2008 water elevation, inflow and outflow plots	Island Lk status: Island Lake appears to be generally following the normal trend, with elevations slightly higher than average Precipitation status: December had higher than normal precipitation, while January was much drier than average. Precipitation total was 1.6" above average for the winter to date. Drought status: Area is currently in a non-drought condition. Temperature outlook: We are in a moderate to strong La Nina event, indicating the possibility lower than average temperatures through March. Precipitation outlook: No confidence either way for rest of winter. Average conditions forecast. Soil moisture model (55 yr simulation): Higher in all zones; soils are saturated and frozen. Volume exceedance: Under normal operating rules (April 1 st -June 1 st) there is a 80% chance of refill to 38.5 ft.	Normal operating conditions are assumed for remaining winter months. Should significant additional precipitation occur in February and March, increased discharge prior to April 1 may be required. Next meeting is tentatively scheduled for April 28-29, 2008 via teleconference. Meetings will be scheduled after the 17 th of the respective month to incorporate most recent NWS data.
Pre-Winter Meeting November 7, 2007	MDNR (4) NWS (3) BOWMAN LK ASSOC (1) MP (7) ISLAND LK COMM (3)	NWS and State Climatology data, model output and forecasts Island Lake 2005, 2006 and 2007 water elevation, inflow and outflow plots	Island Lk status: During the summer months, Island Lake fell below the target elevation by 1-2 feet. The severe drought conditions and accompanying low lake levels were alleviated by heavy rains in September and October, and current lake levels is at or slightly above target elevation. Precipitation status: Precipitation deficit was high for the summer months, but improved significantly during September and October. Drought status: North central and NE Minnesota were in severe to extreme drought for most of the summer months. Recent heavy precipitation in Sept. and October has classified area as being currently in a non-drought condition.	Normal operating conditions are assumed for winter months. Should warm winter conditions/low precipitation occur, status of operating conditions from normal to dry will be revisited. A slightly earlier-than-normal mid-winter meeting will be used to reevaluate conditions prior to spring run-off. Next meeting is tentatively scheduled for January 31, 2008 via

**MINNESOTA POWER ST LOUIS RIVER PROJECT FERC 2360
ISLAND LAKE RESERVOIR TECHNICAL COMMITTEE MEETING SUMMARY**

MEETING DATE & PLACE, E-MAIL OR CONFERENCE CALL	ATTENDEES	INFORMATION REVIEWED	SUMMARY OF RESERVOIR, CLIMATOLOGICAL & HYDROLOGICAL CONDITIONS	DECISIONS AND ACTION TAKEN
			<p>Temperature outlook: Possible La Nina winter could bring colder than average temperatures. Precipitation outlook: Better than average chance of below normal precipitation for November, no confidence either way for December or January. Soil moisture model (55 yr simulation): Top soil layers had low moisture levels, bottom soils were saturated. Volume exceedance: Under normal operating rules (April 1st-June 1st) there is a 73% chance of refill to 38.5 ft.</p>	teleconference.
Spring Refill May 4, 2007 meeting at Thomson	MDNR (6) NWS (4) BOWMAN LK ASSOC (1) MP (8) ISLAND LK COMM (2)	NWS and State Climatology data, model output and forecasts Island Lake 2005, 2006 and 2007 water elevation, inflow and outflow plots	<p>Island Lk status: Drawdown ended in late March almost 3 ft above allowed limit. Current reservoir level is approx. 1.9 ft below June 1st target of 38.5 ft and 0.9 ft below July 15th dry target upper limit of 37.5. Precipitation status: Precipitation deficit improved over last 3 months. Drought status: North central and NE Minnesota in moderate (D1) to severe (D2) drought. Temperature outlook: Next 3 months no confidence to predict above or below normal. Precipitation outlook: Better than average chance of for wetter than normal May, no confidence either way for June and July. Soil moisture model (55 yr simulation): 0.5 to 1 inch below normal across northeastern Minnesota. Volume exceedance: Under dry operating rules (April 1st-July 15th) there is an 80% chance of refill to 37.5, and a 55% chance of refill to 38.5 ft.</p>	<p>Dry operating condition still in effect with release of Q95 flows from Island Lake Reservoir (May 219 cfs and June 263 cfs or inflow whichever is less). When 37.5 ft is reached revert to normal license minimum flows.</p> <p>Next meeting is scheduled for Wednesday, November 7th. Face to face meeting or teleconference to be determined.</p>
April 4, 2007 THughes e-mail			Dry operating condition declared for previous time period and NWS Drought Monitor status D1 or greater.	Island Lake discharge ramped down to Q95 flow (186 cfs or inflow whichever is less).
Mid-Winter Meeting February 2, 2007 – Video teleconference at MPCA Duluth and MDNR St.Paul offices	MDNR (5) NWS (5) BOWMAN LK ASSOC (1) MP (5) ISLAND LK COMM (2)	NWS and State Climatology data, model output and forecasts Island Lake 2005, 2006 and 2007 water elevation, inflow and outflow plots	<p>Island Lk status: Drawdown rate is adjusted to leave an additional 2.5 ft in reservoir by March 31st. Precipitation status: Snowfall in the Cloquet R. watershed ranged from 25 to 28 inches below normal. Drought status: North central and NE Minnesota continue to be in and extreme drought (D3) and predicted to persist through April 2007. Temperature outlook: Next three months predicted to be above normal. Precipitation outlook: Next three months no confidence to turn to a wetter pattern. Soil moisture model (55 yr simulation): Nearly all current soil moisture states for Island and Alden Lk basins were in the lower quartile. Volume exceedance: Under dry operating rules (April 1st-July 15th) there is 58% chance of refill to 36 ft, a 50% chance of refill to 37.5, and a 40% chance of refill to 38.5 ft</p>	<p>Dry operating condition still in effect with restricted drawdown to 30.3 ft sill or 1360.61 mean sea level (2.5 ft above normal drawdown to 27.8 ft sill).</p> <p>Next meeting is scheduled for Friday, May 4th at Thomson Hydro.</p>
Pre-Winter Meeting November 17, 2006 – Video teleconference at MPCA Duluth and MDNR St.Paul offices	MDNR (5) NWS (4) BOWMAN LK ASSOC (1) MP (5) ISLAND LK TECH COMM (2)	NWS and State Climatology data, model output and forecasts Island Lake 2005 and 2006 water elevation, inflow and outflow plots	<p>Island Lk status: Matching Alden Lk gauge inflow to Island Lk outflow since mid-August. Island Lk elevation was 36.8 ft (1.7 ft below normal pool 38.5 ft) on 11/17/06. Precipitation status: Summer and fall precipitation stations in or near Cloquet R. watershed ranged from 4 to 9 inches below normal. May through October precipitation in Cloquet R. watershed ranged from 12 to 14 inches which is 5 to 7 inches below normal and rank in the top 10 to 20 percent driest period on record. Drought status: North central and NE Minnesota continue to be in and extreme drought (D3). Outlook is for drought to persist through February 2007. Temperature outlook: December through February average temperature warmer than normal. El Niño winter predicted. Precipitation outlook: Strong tendency to deviate from normal. Soil moisture model (55 yr simulation): Nearly all current soil moisture states for Island and Alden Lk basins were in the lower quartile. Volume exceedance: Under wet rules (April 1st-June 1st) there is 25% a probability of spring 2007 refill based on current soil moisture and a 65% chance of refill based on climatological probability. Under dry rules (April 1st-July 14th) there is a 65% chance of dry rule refill based on current soil moisture and an 85% chance of dry refill based on climatological probability.</p>	<p>Due to continued drought conditions, the group decided to declare a dry condition and adjust the drawdown upward by 2.5 feet (30.3 ft sill or 1360.61 mean sea level).</p> <p>Drawdown recommendation will be re-evaluated at the mid-winter meeting to be held on February 2, 2007. Video conference system worked very well and will be used again for the next meeting.</p>
May 3, 2006 Spring Refill Mtg	MDNR (4) NWS (3) BOWMAN LK ASSOC (1) MP (5) ISLAND LK TECH COMM (3)	NWS and State Climatology data, model output and forecasts Island Lake 2005 and 2006 water elevation, inflow and outflow plots	<p>8-14 day precipitation outlook: slightly enhanced chance (10%) of above normal precipitation from May 8-16. Normal rainfall for period is 0.8 inches. 3 month outlook: slightly enhanced chance of above normal precipitation for May, June and July. Drought status: None for northeastern Minnesota. D0 (abnormally dry) status in north central Wisconsin has expanded into northwest Wisconsin and upper Michigan, but not to northeastern Minnesota. If drought in southern plains and Gulf Coast states continues, it could block future summer moisture from the Gulf of Mexico. Soil moisture model for 2006: Upper soil moisture above average and below average in the lower zone (due to below average rainfall in late summer 2005). If summer 2006 rainfall is below normal, the below average lower soil moisture could lower the summer 2006 lake level because there would be less groundwater recharge to the Cloquet River. Refill forecast 5/1-6/1: 25% chance of achieving refill target of 38.5 ft (1368.81 MSL). Runoff volume forecasts: From Dec 1st to Feb 1st, refill model runs, there was 15% probability drop in achieving a June 1st refill (from 70% to 55%). The May 1st refill model run probability was 25%. (a drop of 30% from Feb 1st). The late April 2005 forecast of 10% for refill was much lower than April 2006.</p>	<p>Due to early snowmelt and run-off, the 2005-2006 winter drawdown was 1 foot above the allowed elevation of 27.8 (1358.11 MSL) by March 31st. Refill as of May 3rd was ahead of schedule and within about 2.5 feet of the full pool target of 38.5 feet (1368.81 MSL). Late April rainfall helped to increase inflow into the reservoir. The reservoir will be managed in the normal to wet condition as described in the operating plan.</p> <p>The next meeting is scheduled for November 1, 2006 at Thomson Hydro. We will be investigating the use of a teleconference for the next meeting. If a test of this system is satisfactory, we may have the meeting via teleconference in November.</p>

**MINNESOTA POWER ST LOUIS RIVER PROJECT FERC 2360
ISLAND LAKE RESERVOIR TECHNICAL COMMITTEE MEETING SUMMARY**

MEETING DATE & PLACE, E-MAIL OR CONFERENCE CALL	ATTENDEES	INFORMATION REVIEWED	SUMMARY OF RESERVOIR, CLIMATOLOGICAL & HYDROLOGICAL CONDITIONS	DECISIONS AND ACTION TAKEN
February 8, 2006 Mid-Winter Mtg	MDNR (5) NWS (4) BOWMAN LK ASSOC. (1) MP (4)	NWS and State Climatology data, model output and forecasts Island Lake 2005 and 2006 water elevation, inflow and outflow Reviewed Island Lake Operating Plan (dated November 2005) Reviewed Island Lake Summary of Operational Decisions table	Drought status – None Precipitation forecast – Equal chance of exceeding, meeting or not meeting normal precipitation Snow water equivalent – 2.75 inches Current snow depth ranking in the 40 to 80 th percentile for watershed NWS model – 58% probability of sufficient spring runoff to refill by June 1 st NWS model refill comparison of current to historic conditions – 13 years would not refill, 13 years would refill by June 1 st	Current conditions were declared to be normal. MP will adjust drawdown schedule to achieve 1358.11 ft (27.8 ft) by April 1 st . NWS Drought Index and precipitation received over the next 4-5 weeks will be watched closely to determine if re-adjustment of drawdown is needed. Next meeting date: May 3, 2006, 10:30 AM at Thomson Hydro
December 15, 2005 T. Hughes e-mail	Sent to MDNR, NWS, Island Lake Technical Committee members, and MP	NWS climatological and hydrology data	NWS update indicated that not much had changed since late October.	MP adjusts over winter drawdown schedule to achieve approximately 1359.11 feet (28.80 ft), which is one foot above the FERC-License lower limit. The drawdown schedule will be reviewed at the mid-winter February meeting.
Pre-Winter Meeting November 3, 2005 - Thomson Hydro	MDNR, NWS and MP	NWS and State Climatology historic data, model output and forecasts, Island Lake plot of elevation, inflow and outflow. Final review of MNDNR revisions to the Island Operating Plan.	Elevation holding flat at approx. 37.35. July-September precipitation was 5-7 inches below normal. Mid-September drought index at moderate to severe (D1 to D2) status for watershed. Precipitation and temperature outlook equal chance of being above or below normal. Recent precipitation has increased inflow to allow for license minimum discharge being released starting in late October. Based on NWS model using late October 2005 soil moisture conditions, there is 70% chance of exceeding the volume of inflow needed to achieve spring 2006 refill (April 1 – June 1).	Wait to see how November precipitation shapes up before making a final decision on the extent of over winter drawdown. Review after the 1 st of December and distribute a proposed drawdown schedule at that time. MNDNR to distribute updated table of Island Lake Operating Plan which will include revised language.
August 22, 2005 T. Hughes e-mail to MNDNR	Sent to MNDNR – Ian Chisholm	Island Lake elevation and inflow	Trigger elevation of 37.35 (1367.66) for reducing outflow below FERC license minimum (1996 MNDNR and MP agreement) has been reached. Alden Lake gauge inflow at 36 cfs.	Ramped down outflow to match inflow.
August 9, 2005, Tobie's Restaurant Mtg Room, Hinckley, MN	MDNR, NWS, Island Lake Technical Committee members, and MP	NWS climate briefing, Island Lake elevation and flow plot, MNDNR proposed language changes to Island Lake Operating Plan for dry conditions.	NWS presented information about long and short term forecasts. NWS recommended using short term forecasts in operational decisions for Island Lake. MNDNR presented revisions to the Operating Plan of November 2004. July 26 th , August 2 nd drought monitor at D0 Abnormally Dry status. July precipitation was 4 inches below normal. Elevation dropped below 38.5 but still above 37.5 low flow trigger. Inflows dropping and 165 cfs minimum flow being released.	Match outflow to inflow when elevation reaches 37.35 (per 1996 MNDNR agreement). An agreement was also made that the Island Lake Operating Plan would be reviewed and revised as necessary even if more frequent than every 5 years as required in the current FERC license.
June 15, 2005 e-mail from T. Hughes	Sent to MDNR, NWS, Island Lake Technical Committee members, MP		Island Lake reached normal target elevation on June 3, 2005.	Conference call to discuss dry operation was not necessary since reservoir filled due to recent rainfall received.
May 26, 2005 e-mail from T. Hughes	MDNR, NWS, Island Lake Technical Committee members, MP		With recent rain, the elevation of Island Lake is within 1 foot of June 1 st target of 38.5 (1368.81) feet and rising. More rain is forecast.	Suggested a conference call the following week to make final a decision on any operational changes.
Spring Refill May2, 2005	MDNR, NWS, Island Lake Technical Committee members, and MP	NWS Service and State Climatology historic data, model output and forecasts, Island Lake plot of elevation, inflow and outflow.	Despite good run off predictions, spring inflow dropped due to dry March and April (4 th driest on NWS record at Duluth Airport). Refill to full pool probability dropped to 7-10 % for a June 1 refill. NWS forecast for May-July is for above average precipitation and below average temperatures.	Match outflow to inflow unless inflow (Alden Lake gauge) exceeds minimum flow. Anything above minimum flow would be held in reservoir. Evaluate May 19-26 elevation, inflow and NWS forecast to determine if further operation changes are necessary by June 1 st .
Mid-Winter February 2005 - E-mail exchange of information	Distribution of information via e-mail and regular mail.	NWS Service and State Climatology model output and forecasts.	Probability of equaling or exceeding a maximum snow pack water content of 6 inches over the Island Lake reservoir watershed has increased from 12 percent to 35 percent. Probability of equaling or exceeding 117,000 acre-ft of runoff for the period April 1 - July 1 has increased from near 50 percent to near 90 percent.	Since hydrologic conditions greatly improved, MP proposed to adjust drawdown back to a full drawdown schedule (27.8 FT). All parties were in agreement to proposal. MP made adjustment to outflow on February 9, 2005 to achieve full drawdown by April 1.
Pre-Winter Meeting December 20, 2004 - Thomson Hydro	MDNR, NWS, Island Lake Technical Committee members, and MP	NWS and State Climatology historic data, model output and forecasts, Island Lake plot of elevation, inflow and outflow.	Island Lake watershed experiencing a dry period, but not a designated drought. Forecast of below normal winter precipitation and lower probabilities of exceeding snow water equivalents needed for spring reservoir refill.	Outflow adjusted on December 20 th to allow a 1.25 reduction in the total drawdown by April 1, 2005. Evaluate at mid – winter February meeting to determine if further adjustment of the drawdown is necessary.