INTERNATIONAL
SOURIS RIVER
BOARD

CONSEIL
INTERNATIONAL
DE LA RIVIÈRE SOURIS

International Souris River Board
Grand Hotel
1505 North Broadway, Minot, ND
(800) 735-4493
February 21, 2018

Final Minutes

Board Members:

Garland Erbele, Frank Durbian, Mark Lee, Joe Goodwill, Scott Gangl, Dave Pattyson, Gregg Wiche, Debbie McMechan, Lorinda Haman, Shelly Weppler, David O'Connell, Jeff Woodward, Ken Bottle, Col. Samuel Calkins, David Glatt**.**

Via Conference Call: Russell Boals.
Regrets – Nicole Armstrong, John Fahlman, John-Mark Davies.

Attendees:
Wayne Jenkinson, Steve Robinson, Joel Galloway, Wanda McFadyen, Darin Schepp, Allen Schlag, Curtis Hallborg, Heather Husband, Dorothy Lindeman, Dan Jonasson, Laura Ackerman, Bruce Davison, Laura Diamond, Dwayne Ofukany, Corey Hein, Lana Pollack, Mark Gabriel, Tim Fay, Tom Pabian, Dave Ashley, Dan Jonasson, David Lakefield, Justin Palmer, Randi Morry, Amanda Schooling, Rebecca Seal-Soileau, Micheal Bart, Sally Johnson, Kim Fundingsland, Jim Olson, Jerry Bents, Lynn Kongslie, Tammy Hanson, Jeanine Kabanuk, Wanda McFadyen, Jarvis Kaderlik, Brian Caruso.

1. Introduction and Opening Remarks.

   Garland Erbele opened the meeting at 8:35 a.m. by extending his welcome wishes to all attendees and inviting Board members and other participants to introduce themselves.

2. Approval of Agenda.

   The agenda was approved as circulated.

   Motion: Shelly Weppler moved to accept the agenda as presented. Col. Samuel Calkins seconded the motion. **Carried**.

3. Approval of Minutes:

a. June 27, 2017 Face-to-face Meeting Minutes

Curtis Hallborg mentioned that he had made a couple of comments that weren't included in the current version of the June 27, 2017 Boissevain, MB meeting minutes. The first was in Section 7a; *Review of 2017 Hydrologic Conditions and Operations and Summer Hydrologic Forecast and Planned Operations,* on the bottom of page 3, third paragraph, the second sentence should read: "The flood operations are based on Sherwood ***local*** flows exceeding 37,000 dam^3". The second comment was also in Section 7a, the third sentence of the third paragraph on page 4; the unregulated peak of 150 m^3/s should only be 50 m^3/s.

Garland Erbele stated that the changes would be included in the final version of the minutes.

Motion: Frank Durbian moved to accept the minutes as revised. Lorinda Haman seconded the motion. **Carried.**

4. Review of Action Items

Russel Boals reported that all outstanding action items have been included in the agenda for this meeting.

5. Review of 2017 Hydrologic Conditions, Spring 2018 Hydrologic Forecast and Planned Operations

a. Saskatchewan

Curtis Hallborg, Water Security Agency (WSA), began his presentation by mentioning that Alameda Dam and Alameda Reservoir were renamed to Grant Devine Dam and Grant Devine Lake, respectively, on November 22, 2017. Grant Devine Lake (Dam) was one of three new landmarks in the Province named for Saskatchewan premiers. Grant Devine was elected, as a member representing the riding where the Alameda Dam is located, and was the premier of Saskatchewan. As premier he was a strong proponent for the Rafferty-Alameda project that is part of his legacy.

2018 Spring Runoff Forecast – Well below normal runoff is projected based on conditions as of February 15, 2018. There was record or near record non-precipitation from April 1 to October 1, 2017, over the western portions of the basin and 40 to 60 percent of normal fall precipitation from September 3 to November 1, 2017. Assuming average precipitation for the remainder of February through to April, and a normal melt results in a less than 1:10 year event, which is below the median and is nowhere close to triggering flood operations. Therefore, no additional pre-runoff flood operation drawdowns, beyond the normal drawdowns, are required at this time.

- Grant Devine Lake reached its normal drawdown level (NDL) of 561.0 m (1,840.55 ft) on January 14, 2018, which is 1.0 m (3.28 ft) below its full supply level.
- Rafferty reached its NDL of 549.5 m (1,806.10 ft) on January 16, 2018, which is 1.0 m (3.28 ft) below its full supply level.

- Boundary Reservoir was at an elevation of 559.19 m (1,834.14 ft) on February 21, 2018, which is 1.64 m (5.38 ft) below its full supply level.

None of the three reservoirs in Canada are expected to fill given the current flow forecast. Boundary Reservoir will divert to Rafferty Reservoir if there is any excess. Rafferty will perform a controlled release if necessary. Grant Devine Dam will perform a controlled release if necessary.

The WSA will make releases from Grant Devine Dam to meet its apportionment obligations under the Agreement.

The WSA will be issuing a tender package in February for the replacement of the spillway Programmable Logic Controller (PLC) at Grant Devine Dam. The work is tentatively planned for March 2018. The WSA believes that it is low risk because the conditions in the basin are currently dry, the Low-Level Outlet has a capacity of 65 m^3/s (2,295.2 ft^3/s) and the spillway gates can be operated using a standby hydraulic system at the dam.

Garland Erbele asked if Boundary was expected to spill to Rafferty this year. Curtis Hallborg answered that based on current conditions it is not expected.

Based on the projected runoff volumes, the apportionment split will be 50/50 according to Annex B of the 1989 International Agreement.

b. North Dakota

Steve Robinson, USGS, provided a summary of 2017 flow conditions for the US portion of the Souris Basin. According to Steve Robinson's report, the total volume of flow past the Long Creek at the Noonan gage through December 31, 2017 calendar year was 38,440 acre-ft (47,397 dam^3). This volume is about 236% greater than the median flow for the last 57 years. The peak discharge for the reporting period January 1 to December 31, 2017 is 2,160 ft^3/s (61 m^3/s), which ranks 15 in 57 years of record.

The total volume of flow past the Souris River near Sherwood gage through December 31, 2017 calendar year was 108,300 acre-ft (133,534 dam^3). The total flow is 200% greater than the median flow for the last 86 years. The peak discharge for the period January 1 to December 31 was about 1,850 ft^3/s (52 m^3/s).

Flow recorded at the Souris River near the Westhope gage, through December 31, 2017 calendar year was 569,200 acre-feet (701,824 dam^3). The calendar year's total flow is about 473% of the median flow for the last 87 years. The minimum flow for the period was 4.25 ft^3/s (0.12 m^3/s), which occurred on October 27, 2017. The peak discharge for the period January 1 to December 31, 2017 was 8,360 ft^3/s (237 m^3/s) on April 7, which ranks 3rd in 87 years of record.

Allen Schlag of the National Weather Service (NWS) provided an overview of the weather conditions leading up to this spring. The hydrologic conditions in 2017 started off really well with snowmelt and runoff, however, it quickly ended with drought beginning to set in early to mid-March. Soil moisture sustained the growing season despite the lack of precipitation. August and September saw decent precipitation, but October, November and December slid back into the dry trend. Currently soil moisture in North Dakota is ranked around the 10th or lower percentile with a deficit of around 40 mm (1.6 inches) of water in the soils.

The current lack of soil moisture combined with no significant snow events over the winter suggests that there will be little to no runoff this spring, unless there is a significant change in the weather. While recently there has been scattered snow showers, there hasn't been a large enough event to alleviate the moisture deficit. These recent events have only left trace amounts of precipitation in the basin that quickly evaporates prior to the next snow. It is expected that unless there is a significant rain event in early March, the majority of the snow on the ground will be absorbed into the ground, resulting in limited run off.

The current weather pattern of one to two inches of weekly snow fall with a tenth of an inch of water content is anticipated to continue. The current La Nina is expected to dissipate in March or April with normal precipitation conditions expected after that. It is predicted that without a significant rain event, spring will have a quick green up then feel pressure from further drought conditions

Garland Erbele asked about the role of evaporation and the winter snowpack. Allen Schlag answered that the role of sublimation can be highly variable. In years such as this one where snow events are small, sporadic and followed by above freezing temperatures, the snowpack isn't given time to consolidate and the dry air draws the moisture out of the snow and back into the atmosphere.

Garland Erbele then noted that it was amazing with the amount of snowpack across the basin in the winter of 2017, how quickly it turned into drought, and also observed how quickly the mountain snowpack in Montana recovered from the severe drought that occurred there last season.

c. US Fish and Wildlife Service (USFWS)

Frank Durbian presented a summary of refuge operations and flows for 2017. The total provisional inflow measured at Sherwood for the first five months of the year was 88,352 acre-ft (108,982 dam^3). This was 106% of the historic January-May inflow, which was 83,460 acre-ft (102,948 dam^3) for the period 1938 through 2017. Total Upper Souris Refuge pool volume increased an estimated 3,240 acre-ft (3,997 dam^3) during the first five months. The total provisional outflow measured at Foxholm on the south end of the Upper Souris Refuge for the first five months of 2017 was 108,644 acre-ft (134,012 dam^3). This outflow was 152% of the historic record for the January-May outflow, which was 71,488 acre-ft (88,180 dam^3) for the period 1938-2017. Lake Darling elevation decreased 0.12 ft (0.04 m) from 1596.24 ft (486.53 m) on January 1st to 1596.12 ft (486.50 m) on May 31, 2017. The lake elevation on June 1st 2017 was 1596.12 ft (486.50 m).

Total yearly provisional flow at Sherwood was 108,875 acre-ft (134,297 dam^3). This was 92% of the historic average annual inflow (based on calendar year), which is 118,143 acre-ft (145,729 dam^3) for the period of record from 1938-2017. Total yearly provisional outflow measured at the Souris River near Foxholm on the south end of the Refuge was 117,873 acre-ft (145,396 dam^3). This was 97% of the historic average annual outflow which is 120,905 acre-ft (149,136 dam^3) for the period of 1938-2017. Total outflow was 8,998 acre-ft (11,099 dam^3) more than total measured inflow. On December 31, 2017, Lake Darling was at an elevation of 1595.76 ft (486.39 m).

With regards to the J. Clark Salyer National Wildlife Refuge, the total provisional flow measured from the Souris River to the Refuge from January 1 through May 31 was 198,781 acre-ft (245,196 dam^3). This was 184% of the historic January-May inflow, which was 108,115 acre-ft (133,360 dam^3) for the period of 1938-2017. Pool volume on May 31 was 27,473 acre-ft (33,888 dam^3). This was 4,872 acre-ft (6,010 dam^3) below the January 1st volume. Approximately 531,559 acre-ft (655,678 dam^3) was passed to Manitoba during the five-month period.

Total outflow measured at Westhope for the 2017 calendar year was 554,577 acre-ft (684,071 dam^3). Total outflow was 326,842 acre-ft (403,160 dam^3) more than total measured inflow on the Souris River at Bantry, ND. Outflow during the June 1st to October 31st period was 19,194 acre-ft (23,676 dam^3) or 13,125 acre-ft (16,190 dam^3) above the 6,069 acre-ft (7,486 dam^3) required minimum.

The average daily flow at the Westhope gage fell below the minimum 20 ft^3/s (0.57 m^3/s) threshold 12 times during this time period, likely due to a combination of relatively low calculated flows and wind fetch. The target flow was missed from October 12th to the 19th, the 24th, the 26th through 27th, and the 30th through the 31st. The lowest recorded daily mean flow during the June 1st to October 31st time period was 4.25 ft^3/s (0.12 m^3/s) and occurred on October 27, 2017.

Frank Durbian noted that the USFWS experimented with holding Lake Darlings June 1st target level at 1596.0 ft (486.46 m) in an attempt to create storage for late summer rains that have been causing issues the last few years. Those rains never came, so Lake Darling went into the summer with a deficit.

Lake Darling and J. Clark Salyer operations for 2018 are planned to be typical depending on weather and vegetative response. The USFWS plans to take advantage of the drier season to dry down some of the pools in J. Clark Salyer and replace some staff gauges.

Mark Lee asked about the current release out of Pool #357. Frank Durbian responded that at the beginning of the year it was at 92 ft^3/s (2.6 m^3/s) but has decreased, most likely due to the ice pack being around 30+ inches, to around 10 ft^3/s (0.28 m^3/s).

Scott Gangl asked if the USFWS was releasing water out of Lake Darling this year. Frank Durbian said they plan to release 10 to 15 ft^3/s (0.28 to 0.42 m^3/s). Scott then asked if during those small releases do they see the flow response all the way down to J. Clark Salyer. Frank answered that they actually do but are unsure if the response is from the releases, or if there is some lateral water movement or other inputs downstream of Lake Darling.

d. Manitoba

Mark Lee reported in Manitoba the spring melt started in late March. The Manitoba tributaries and main stem saw the expected rapid rises, peaking in early April, the melt produced very high runoff. The return period of the flows were in the range of 20-year to over 50-year flood events. The Souris River at Wawanesa peaked at 525 m^3/s (18,500 ft^3/s) on April 5th, which is considered to be a 1 in 40-year flood event. Only the floods of 1882, 1904,

1976 and 2011 exceeded the peak flow of 2017. Some Manitoba municipalities declared local states of emergency due to overland flooding.

After the spring freshet, flows continuously declined on the main stem reaching the lower portion of the normal range from July 1st to winter freeze up. Throughout the early summer of 2017 precipitation was mixed, causing some areas to remain wet from the spring and other areas to dry out. Summer precipitation was generally normal to below normal, timely rains generally prevented agricultural drought impacts.

The 2017 Antecedent Moisture Index (API), which is a comparison of the current year's precipitation from May to freeze-up to the historical record, shows the Manitoba portion of the basin was normal to below normal.

The Manitoba portion of the Souris River Basin has received below normal snow cover in winter 2017/2018. Environment and Climate Change Canada's (ECCC) February 13, 2018, snow survey shows 20 to 40 mm (0.8 to 1.6 inches) of snow water equivalent across the basin, with slightly more at the very downstream end.

At the end of January, the US Drought Monitor and Canadian Drought Monitor maps placed the Souris River Basin under moderate drought conditions, with sever to extreme conditions in the headwaters portion of the basin. The flow at Wawanesa on January 13, 2018, was 0.25 m^3/s (8.8 ft^3/s), within the normal range, but near the 25th percentile.

The Manitoba Hydrologic Forecasting and Coordination Branch has reported that the risk of flooding for the spring of 2018 remains low for the entire province and the NWS's probabilistic forecast at the North Dakota-Manitoba border shows the probability of 2018 spring flooding as much lower than the historical average.

Gregg Wiche asked about all of the reservoir's operating plans of maintaining storage with no releases in the expectation of little to no spring runoff and summer precipitation and the risk of coming close to the minimum 4 ft^3/s (0.11 m^3/s) flow requirement. Curtis Hallborg answered that typically there is enough base flow to maintain that requirement and there would be releases as required to maintain the apportionment. Gregg followed up his question with a contemplation made towards meeting the apportionment requirements, if necessary, by sustaining minimal releases from the reservoirs to maintain a live stream that would follow the Agreement's desire to maintain "flows as seen in nature", as opposed to causing fluctuations in the reach with irregular greater releases as needed. Curtis responded that operating the reservoirs in that manner could be considered if it is thought to be ecologically beneficial downstream. Allen Schlag made the observation that around the Towner, ND area during times of low flow, the base flow is provided by surficial aquifers in the area that may already be stressed from the lack of precipitation and that a larger initial release from the Canadian dams may be needed to replenish the aquifer's losses in order to maintain that baseflow during this year's potential low flow possibility. Scott Gangl mentioned that the USFWS has made the effort to maintain a live flow between Lake Darling and Salyer throughout the years with great success of preventing a fish kill. It was agreed that hopefully March and April bring more precipitation to alleviate the potential drought stress. Jeff Woodward mentioned that ECCC may be able to provide more detailed information concerning natural flows in the Souris River in order to better prepare for potential actions this season. Lynn Kongslie explained how river management in regards to flows effect the Eaton Irrigation District. There was further discussion on the extreme variability of the Souris River Basin.

6. Compilation of Souris River Flows to December 31, 2017

Jeff Woodward explained how the ECCC determines the natural flows at the International boundary, pointing out the mechanics of some of the individual sub-basins that are involved, he then handed off to Corey Hein of ECCC for his report.

Corey Hein outlined the results of natural flows determined by ECCC for the period ending December 31, 2017. The total diversion in the Souris Rivers basin was 83,431 dam^3 (67,665 acre-ft). Recorded flow at Sherwood was 133,576 dam^3 (108,334 acre-ft). The natural flow computed at Sherwood was 198,692 dam^3 (161,145 acre-ft). According to these computations, the US share at 40% was 79,480 dam^3 (64,461 acre-ft). The flow received by the US was 135,571 dam^3 (109,952 acre-ft), which constitutes a surplus delivery of 56,091 dam^3 (45,491 acre-ft). These flows are very close to average. The annual flow requirement / apportionment at Long Creek station has also been met with a surplus of 19,829 dam^3 (16,082 acre-ft).

Garland Erbele asked if there were any impacts to baseflows seen from the amount of artificial drainage that is being performed in the basin. Jeff Woodward noted that there is some drainage in the upper Souris Basin that is monitored by ECCC and included in the Natural Flow Computations, but there is also an unknown amount of drainage in the basin that isn't accounted for and what influence it may or may not have needs to be investigated. It is felt that the effects of drainage and its perception is much larger than thought. While the size of the area being drained is relatively small, there is a cumulative effect that may have a bigger impact than known.

Corey Hein noted that the Natural Flow computations are normally only done three times a year, but may be able to be performed more often as necessary during times of drought when a higher resolution for decision making may be required.

7. Update from the Hydrology Committee

Ken Bottle reported that the Hydrology Committee's progress regarding working on the ***Apportionment Procedures Manual*** for the Souris River has made slow progress. The Committee is currently refocusing their efforts and are planning on producing a simple procedures manual for the computation of natural flows and the determination of the apportionment with a supplemental document containing the details and history of the Hydrology Committee and the development of the apportionment determinations. Ken Bottle also recognized Jeff Woodward's role for producing the latest draft. The Committee plans to have a final draft of the simplified procedures manual at the June meeting and be working on the supplemental document.

Ken Bottle also noted that Bob White and Dave Helfrick are no longer on the Hydrology Committee and recommended Darin Schepp and Corey Hein to take their places, respectively.

Motion: Mark Lee moved to place Darin Schepp and Corey Hein on the Hydrology Committee. Shelly Weppler seconded the motion. **Carried.**

8. Water Quantity Monitoring

a. Report on Canadian Water Quantity Monitoring Plans for 2018 with Highlights from 2017

Dwayne Ofukany reported that the water monitoring network for this year will remain the same as it was last year. There are plans to move one of the stand-alone weather stations at Handsworth to the Moose Mountain Lake Hydrometric Station. The weather station collects data for wind speed, humidity, temperature, radiation and has a tipping bucket. The intent is to consolidate the stations to save time. There are no foreseen issues with the move.

Garland Erbele ask what the period of record on the site was. Corey Hein answered that in the beginning it was just a manual reading taken by the landowner, then in 2012 it was upgraded to a digital electronic version. Curtis Hallborg then asked if the station would then be made into a "real-time" station after the consolidation. Corey Hein answered that most likely it would.

Jeff Woodward noted that the changes made to the evaporation stations in Canada may have an effect on the procedures for the determination of natural flows in the river and requested that Dwayne Ofukany send an overview of the proposed changes to the Hydrology Committee for them to evaluate the effects that it may have. Dwayne Ofukany responded that he would get something out to them

Dwayne Ofukany then mentioned that there is also plans to switch out a couple data-loggers in the Souris Basin this summer because of age. They are also involved in a pilot study looking at uploading data in the field directly into Aquarius. Dwayne Ofukany also mentioned that they are looking into the use of remote control boats for data acquisition for convenience and cost saving.

Curtis Hallborg mentioned that Dwayne Ofukany's group was very beneficial for performing spot measurements used in determining local flows below the Canadian reservoirs.

b. Report on United States Water Quantity Monitoring Plans for 2018 with Highlights from 2017

Steve Robinson reported that there are still infrastructure concerns related to aging gauge stations and the stress on them caused by the 2011 flood. There are several stations poised to fall into the river and with the predicted drier season, the US Geological Survey (USGS) is planning on performing site work this year. There are no expected changes to the stream gauging network for 2018.

Allen Schlag asked about the new gauge being placed at the Broadway bridge in Minot, ND. Steve Robinson mentioned that they are waiting for the construction of the bridge to be completed before adding the gauge to the network.

Garland Erbele asked if the Sherwood gauge was one of the gauges being considered for the USGS's planned site work. Steve Robinson answered that it is, but there are other gauges with higher priority.

Gregg Wiche asked Steve Robinson if any of the gauges were going to be moved as part of the site work that was being performed. Steve Robinson responded that they don't anticipate moving any of the gauges, however they may move away from the use of stilling wells at the site, so some of the equipment may change.

11. Water Appropriations in the Souris River Basin during 2017

Curtis Hallborg reported that seven Approvals to Operate, with a combined allocation of 220 dam^3 (178 acre-ft), within the effective drainage area of the basin were canceled in 2017. There were three Approvals to Operate, with a combined allocation of 450 dam^3 (365 acre-ft), within the effective drainage area of the basin approved in 2017. Of the 10 projects that were canceled or approved, only six of the cancelled projects would meet the criteria for minor project diversions and none of the approved projects would.

Garland Erbele asked if the industrial permits were being used for fracking. Curtis Hallborg answered that he wasn't sure if that's what they were being used for. David Pattyson mentioned that Grant Devine Dam is the preferred source for frack water, and that Rafferty has provided water for that use as well. There was then a conversation on the increase of water use arising from slick fracking and questions on the potential effects from the cumulative withdrawal of water for frack use.

Darin Schepp reported that there were two conditional groundwater water permits issued in 2017, with a combined allocation of 170 acre-ft (210 dam^3), and eight temporary groundwater permits with a combined authorized use of 249 acre-ft (307 dam^3). There were also three conditional surface water permits issued in 2017, with a combined allocation of 171 acre-ft (211 dam^3), and 40 temporary surface water permits with a combined authorized use of 919 acre-ft (1,133 dam^3). The majority of the temporary surface water permit's authorized use was from isolated sloughs that normally make minimal contributions to the Basin.

Lana Pollack asked about who monitors the long-term effects on groundwater sources. Garland Erbele stated that in North Dakota, the North Dakota State Water Commission's (NDSWC) Appropriations Division closely studies and maintains North Dakota's groundwater resources. Garland Erbele also mentioned that the Appropriations Division is currently contracting Electromagnetic Surveying work to better quantify and characterize aquifers with higher resolution data. Lana Pollack expanded her question to ask if there was a concern with the long-term effects of groundwater withdrawals. Garland Erbele explained that there is a long-term concern especially with the growth of the oil industry. The Board further discussed the increased amount of water use for the newer methods of oil well development.

10. Update from the Flow Forecasting Liaison Committee (FFLC)

Laura Diamond of the NWS reported on the recent activities of the FFLC, which consisted of coordination on a February 1st spring outlook and a February 15th spring outlook. The current outlooks of dry weather haven't warranted a conference call, but the FFLC will meet to discuss any potential concerns if the conditions change. The FFLC will continue to coordinate forecasts on the first and fifteenth of the month until runoff commences.

Laura Diamond also noted that there have also been member changes within the FFLC. Corey Hein was recommended as a replacement for Dave Helfrick, Darin Schepp as a replacement for Bob White and Mitch Weier of the US Army Corps of Engineers (USACE) as an alternate for Elizabeth Nelson.

Motion: Frank Durbian moved to place Corey Hein and Darin Schepp on the Flow Forecasting Liaison Committee and name Mitch Weier as an alternate to Elizabeth Nelson. Shelly Weppler seconded the motion. **Carried.**

Garland Erbele asked what the prediction was for flood potential this spring. Laura Diamond stated that there is a lower than normal risk, however it is known that conditions can change very rapidly in the Basin.

11. Update from the Aquatic Ecosystem Health Committee (AEHC)

Heather Husband reported that members of the AEHC discussed potential changes to the presentation of water quality data in the Annual Report via calls emails and a conference call on January 17th. The discussion ended on the conclusion that the Board's input was needed about the required obligation of the AEHC concerning the level of detail necessary for reporting objectives that have not been met. Heather Husband noted that the 1989 Agreement includes a provision for the establishment of a Joint Water Quality Program (Program). Article IV of the 1989 Agreement states: *boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health of property on the other.* Article IV also provides guidelines for the Program group: Develop recommendations for Water Quality Objectives, exchange data provided by the Program, collate, interpret and analyze Program data, review the Program and Water Quality Objectives every five years and recommend modifications. Article IV also requires the submission of an annual report that includes: a summary of the groups yearly activities, a summary of principal activities affecting yearly water quality in the Souris River Basin, a summary of the JWQP data, a summary of the water quality at the two border crossings, a summary of definitive changes and potential causes, a discussion on if Water Quality Objectives have been attained, a summary of other significant water quality changes and potential causes, and AEHC recommendations regarding Water Quality Objectives. Article IV also states that if the AEHC's annual report indicates that Water Quality Objectives are not being attained, the Parties shall begin consultations to determine how the Water Quality Objectives can be met, revised or otherwise addressed.

The AEHC is looking for input from the Board on how to proceed for the 2017 Annual Report and additional changes for the future beyond 2017. The AEHC also provided suggestions, with examples, for moving forward: limit reviewed data to 10 to 15 years past, using other historic data in summaries of exceedances only, standardize the report to look like the Water Quality Section in the International Red River Basin Report, move to a Water Quality Index that has guideline limits to reflect the Water Quality Objectives and is calculated on a three-year rolling average that is more exceedance based for an overall health report, or a combination of the above.

Curtis Hallborg mentioned that he preferred Attachment 2, which was the Water Quality Index option, because it provides a more visual representation of the water quality of the basin. Shelly Weppler concurred with Curtis Hallborg. Frank Durbian agreed but mentioned that it would be beneficial to add some trend analysis.

Garland Erbele asked Heather Husband to expand the discussion on the monitoring frequency and which objectives may require a more in-depth analysis. Heather Husband noted that the monitoring frequency has been uniform with eight samples each year at each site, however, of

the 38 or 42 monitored parameters, there are 12 parameters that consistently sample at the objective limit or exceed it, that warrant a more in-depth focus. Heather Husband also mentioned revisiting a previously submitted IWI grant; *International Souris River Board Annual Report Automation*, to handle the method of AEHC reporting for the Annual Report.

Jeff Woodward mentioned that it is beneficial to see how individual datasets are trending from year to year for datasets that are right around the Water Quality Objectives so that determinations can be derived the conditions surrounding it.

Gregg Wiche mentioned that it may be beneficial to determine if there is a seasonal variability and to further break down the data for the objectives that are of concern so that the range of the dataset can be ascertained. This would provide the ability to determine that if an objective isn't met, the dataset can then be further investigated to see if its within its normal range of sampling or if there should be more of a concern.

Heather Husband hopes to have some of these suggestions put together for the reporting at the June meeting so that the Board may provide comments.

12. Compliance with Water Quality Objectives for 2017

Heather Husband presented a summary of the water quality monitoring program for the Sherwood site and Dorothy Lindeman presented the data for the Westhope site. The USGS collected eight water quality samples from the Souris River at Sherwood, ND and the ECCC collected seven samples at Westhope, ND, and one sample at the alternate site at Coulter, MB, because of access, in 2017. One joint sample between the USGS and ECCC was collected at Sherwood, ND, in August 2017. The following exceedances were highlighted:

<u>Sherwood-USGS/NDDoH</u>

- Total Phosphorus exceeded its Water Quality Objective of 0.10 mg/L for all samples collected in 2017. Values ranged from 0.12 mg/L in June to 0.34 mg/L in April.
- Sodium exceeded its objective of 100 mg/L for 7 of the 8 samples. Results ranged from 71.9 mg/L in April to 326 mg/L in October.
- Sulphate exceeded its objective of 450 mg/L on two occasions with a minimum value of 258 mg/L in April and a maximum concentration of 568 mg/L in October.
- Total Dissolved Solids exceeded the Water Quality Objectives of 1000 mg/L twice in 2017. The minimum value was 510 mg/L, observed in April, the maximum value was 1,370 mg/L in October.
- Total iron exceeded its water quality objective of 300 µg/L six times. The minimum value was 198 µg/L in July, and a maximum value of 3,770 µg/L in April.
- Chloride, Boron, pH and Dissolved Oxygen, which have had exceedances in the past, did not exceed their respective Water Quality Objectives in 2017.

<u>Westhope -ECCC</u>

- Total Phosphorus exceeded its Water Quality Objective 0.10 mg/L for all samples collected in 2017. Values ranged from 0.163 mg/L in January to 0.429 mg/L in September.
- Sodium exceeded its objective of 100 mg/L for 7 of 8 samples. Results ranged from 35 mg/L in April to 265 mg/L in September.
- Sulphate exceeded its objective of 450 mg/L on five occasions. The minimum value was 133 mg/L in April and the maximum concentration was 699 mg/L in September.
- Total Dissolved Solids exceeded the Water Quality Objectives of 1000 mg/L four times in 2017. The minimum value was 354 mg/L in April and the maximum value was 1,451 mg/L, which was observed in January.
- Total iron exceeded its water quality objective of 300 µg/L six times. The minimum value was 171 µg/L in June and the maximum value was 3,380 µg/L in September.
- pH exceeded the Water Quality Objective of 8.5 pH units three times in 2017 and equaled it twice. The maximum value of 9.81 was recorded in July.
- Dissolved Oxygen (DO) concentrations were below the 5 mg/L Water Quality Objective in two samples, one in January and one in February.
- *E. coli* was at a high value of 420 colonies /100 ml in September.
- Fecal coliform - Fecal coliform exceeded the Water Quality Objective of 200 colonies per 100 ml once in September of 2017, with a value of 380 colonies per 100 ml.

Heather Husband noted that the flow at the Sherwood, ND site hasn't been under 10 cfs since 2010, which could explain why DO concentrations have been well above its objective since then. She also mentioned the potential for an IWI proposal for the placement of continuous DO monitors at that site since we may be entering a period of low flows. Heather Husband then proposed to submit a summary of the study to the Board to ascertain their support so that they may submit the IWI proposal as soon as possible.

Curtis Hallborg commented that in 2017, Saskatchewan decided to maintain a continuous flow out of Rafferty Dam throughout the summer and it would be nice to go over the data in order to determine if a correlation exists between the releases and DO levels.

Frank Durbian mentioned that it may be beneficial to take DO readings between the border crossings to investigate the effects that Lake Darling and J. Clark Salyer have on the reach.

Mark Gabriel asked if the samples were composite samples, or if they were taken in one grab for all parameters. Joel Galloway answered that the Sherwood samples are composite samples and that they do a cross-section of 10 different sections, unless there are very low flows where it then would be a grab sample. Westhope samples are grab samples.

Mark Lee asked if there was a copy of the Board's work plan. Darin Schepp mentioned that Girma Sahlu may have a copy of the work plan.

Garland Erbele asked the Board if it would be possible to modify the Motion to add the proposal to the AEHC's reporting because of the unclear listing of the Board's work plan.

Motion: Scott Gangl moved to place the AEHC Dissolved Oxygen IWI Study Proposal Summary to the AEHC's reporting. Debbie McMechan seconded the motion. Carried.

Garland Erbele asked what the Water Quality Objectives are based on. Heather Husband answered that based upon the first report that the Bilateral Monitoring Group put out, the report states that the Water Quality Objectives are based on the best science, but no specifics are mentioned. The AEHC is interested in investigating the Objectives to find relations as to why they were set as they were.

Garland Erbele then asked Mark Gabriel what other Boards were using as the basis for their Water Quality Objectives. Mark Gabriel answered that the Red and the Souris Boards' Water Quality Objectives were created at about the same time and both used a consensus based multi-agency decision. The Red River Board struggles with the same Water Quality Objective issues as the Souris and have submitted an IWI grant proposal to look at the causes of exceedances from a scientific perspective. Lana Pollack mentioned that the Objectives are not internal to the IJC, they have to be approved by the Federal Governments.

Heather Husband asked if the proposed E. Coli Objective has been finalized. Mark Gabriel stated that both Federal Governments are in favor of the E. Coli objective, but that they still want to look into the frequency of sampling at the locations.

Heather Husband then noted that the AEHC was thinking about modifying the Water Quality Objectives for pesticides into Action Limits. The ability of the Board to make changes to Action Limits much easier than Water Quality Objectives keeps better pace with the quick tempo that pesticides enter or exit the market.

Mark Lee asked if there was any follow up to questions that were brought up during the June meeting about the number of exceedances of Picloram, a pesticide used in fighting Leafy Spurge. Heather Husband mentioned that she can check with the Department of Agriculture to see if there is any information available.

13. Water Quality Monitoring Plan

Heather Husband noted that there are no anticipated changes to the Water Quality Monitoring Plan for 2018.

14. ISRB Communication

Russell Boal's report was deferred to the June meeting.

Wayne Jenkinson mentioned that earlier this year a letter was sent to the Board's Co-Chairs and Co-Secretaries that outlines the IJC's new approach to handling communications. The IJC has gathered a dedicated communications staff for each Board. Any communication assistance that is required by each board will be handled by the Board's dedicated IJC communications staff. The ISRB's communication staff member through the IJC is Sarah Lobrichon from the Canadian section of the IJC.

The IJC is also in the process of improving their website. The website is being revamped so that the IJC and each Board will have their own website. The revamp should be finished in June of 2018.

Heather Husband asked if the website would have an intranet or file sharing capability. Wayne Jenkinson answered that the website itself will not have that capability, however, the IJC already has a SharePoint site for this Board.

15. International Souris River Study Board Update (ISRSB)

a. Update from Study Managers, Co-Chairs and Board Members

Jeff Woodward presented an overview of the Plan of Study. The ISRSB's main concentration is on the international aspects of the Souris basin and the 1989 Agreement. The focus includes the Souris River itself and one of the main tributaries; Long Creek. The flood of 2011 made the Board aware that the mechanics of the Basin could produce events of an unexpected magnitude that requires interpreting the operation of the Basin in an encompassing perspective and not just the sum of individual parts. During the 2011 flood, there were daily flows peaking at yearly median flows.

In 2011, there was a flood in the Souris basin. In 2013, the original Plan of Study was proposed with three different options: basic, middle and enhanced option. The Governments approved moving forward with the enhanced option Plan of Study in 2017. The reference provided was for a total of $1,800,000, split between both Federal Governments. The final study is due in March of 2020.

The reference covers eleven points that are matters of concern raised by the Governments. The ISRSB has to evaluate and make recommendations for each of those eleven points. The eleven points are: Data Harmonization, Development of Water Supply Flows, Evaluate Operational Scenarios, Study Physical Processes of Flooding, Operating Plan Review, Recommend Changes to Operating Plans, Evaluate Infrastructure and Operating Alternatives, Evaluate Additional Flood Protection Measures, Assess Adaptation Strategies, Facilitate Collaboration and Anything else deemed important.

The overall purpose of the Plan of Study is to review of all of the elements of the Agreement between Canada and the United States and to make recommendations for improvements in areas that are either unclear or could be done in a more efficient manner. Once the ISRSB has finished their investigation, the results are presented to the IJC who then works with the Federal Governments to incorporate the improvements into the Agreement.

The Plan of Study is divided into four parts: Operating Rules Review; to evaluate and clarify the language used in the main 1989 Agreement, Annex A; the operating plan for the reservoirs, and Annex B; the apportionment agreement. Data Collection and Management; to take inventory of the available and required data and considerations for various operating scenarios and fill in gaps of missing information. There is also a component of public input that is necessary for reservoir optimization. Hydrology and Hydraulics; to set up the modeling platforms that will be used to test different operating scenarios for the Souris River Basin. Plan Formulation; processing all of the gathered information in order to provide solid recommendations as the Board moves forward including evaluating alternatives, dam safety and workshops.

Jeff Woodward noted that the Plan of Study is posted on the IJC website, http://ijc.org/en_/isrsb, and that the best way to provide input was to review the Plan of Study, comparing it to the eleven points of concerns provided by the Governments, and leave comments and feedback at the website. Comments on the ISRSB's draft work plan are due by March 12, 2018.

Michael Bart emphasized that the work being performed by the ISRSB on the Agreement and Annexes is a Basin-wide approach that is taking the rural areas into consideration along with the municipalities, and that the public advisory portion of the plan is a key essential component for finding the best solutions.

Jeff Woodward noted that the climate panel being organized by the ISRSB should provide direction regarding the assessing of climate change, however, with the extreme weather variability that already exists in the Basin, it is difficult to determine if climate change would provide more variability. Jeff Woodward also noted that drainage may be a harder issue to overcome as it is very site specific as to the effects it has upon the basin.

Heather Husband asked how water quality and ecosystem health would be incorporated to the *Recommend Changes to Operating Plans* matter of concern put forth by the Governments Reference. Jeff Woodward answered that right now is the perfect opportunity for Board Members and the public to provide input on how those things should be incorporated into the Plan of Study.

Garland Erbele asked what the ISRSB's plans were for future public meetings. Justin Palmer answered that the ISRSB meetings should coincide with the ISRB meetings to maintain the synergy between the two Boards, and because the purpose of the temporary ISRSB is to help out the permanent ISRB.

Michael Bart mentioned that depending on where the technical work is at the time, the ISRSB may need input from the ISRB and the public, that may necessitate additional ISRSB and possibly ISRB face to face meetings outside of the normal scheduling.

Rebecca Seal-Soileau distributed a scheduling of potential public meetings and PAG Workshops.

b. Update from the 1989 Agreement Core Committee

Elizabeth Nelsen reported that revisions have been finished for Annex A and that a draft copy had been distributed to the Board. Annex A is now waiting to be submitted to the Board and the IJC for review.

16. Update on Water Management Projects

a. Update on the Northwest Area Water Supply (NAWS)

Darin Schepp reported that oral arguments were held in the DC Circuit of Appeals in January for the State of North Dakota's appeal of the DC District Court's denial of ND's motion to modify the injunction to allow design work to proceed on the biota water treatment plant in January. Opinion of the appeal was published in March, overturning the lower court's denial of the motion, the Mandate order from the Circuit court to the district court was sent down in

April and the motion to modify the injunction was granted. Oral arguments for the cross-motions for summary judgement were held in DC District court in March and April. District court issued a minute order to the defendants to consider permitting Manitoba a seat on the adaptive management team, to which both defendants consented.

In August, the DC District court published its opinion and order granting the defendants' motions for summary judgement, denying Manitoba's motion for summary judgement, dismissing Missouri's complaint for a lack of standing in the case and vacating the injunction. The deadline to appeal was in October, by which time both Manitoba and Missouri filed notice of appeal. Statement of Issues to Appeal were filed in November and filing deadlines have been set to end towards the end of March 2018 for substantive filings.

The design of the Biota water treatment plant has begun. The design of the planned replacement clarifiers and associated system at the Minot water treatment facility was finalized and bids were opened in December. The contract was awarded at the February SWC meeting and is waiting for concurrence from the Bureau of Reclamation and the Garrison Diversion Conservancy District.

Mark Lee mentioned that on January 31, 2018, the courts issued a 90-day period for negotiation. Court has been delayed for 90-days for Manitoba to negotiate a settlement.

b. Other planned developments

Curtis Hallborg mentioned that the City of Estevan is looking at switching their raw water supply from Boundary Reservoir to Rafferty Reservoir for a better quality and more secure water supply. Currently they have a consultant investigating intake design.

17. International Watershed Initiative Projects

Wayne Jenkinson explained that the IWI call for proposals will be closing in March or April, and that Mark Gabriel and himself are available to help out with the submission of any proposals.

Wayne Jenkinson also noted that the spring semi-annual meeting will be held during the week of April 23rd, in Washington, DC. The fall semi-annual meeting is currently scheduled for the week of October 23rd in Ottawa, ON, but is tentative and subject to change.

18. 2017 Souris River Basin Post Flood Report

Elizabeth Nelsen reported that the US Army Corps of Engineers has provided a Post Flood Report that went out as a draft. There were no additional comments made and copies are available to anyone who wants one.

Curtis Hallborg asked if it was the final copy of the Flood Report, mentioning that with the transitions, he never received a copy. Elizabeth Nelson answered that it is the final version, but that they would be able to make changes until March 15, 2018.

19. Next Meeting

In the rotation, North Dakota normally would be hosting the next face-to-face meeting, however since it is necessary for the ISRSB to hold public meetings and are on a deadline it was determined that Saskatchewan would be the host.

The next public session and face-to-face meeting is scheduled to be held on June 25, 2018, (Public); and June 26, 2018 (Board) in Estevan, SK.

Action: Saskatchewan will coordinate the hosting of the next face-to-face meeting.

20. Adjournment

The meeting was adjourned at 2:25 p.m. on February 21, 2018 (Minot, ND).

International Souris River Board
ACTION ITEMS – progress updated June 27, 2017

PERSONS OR COMMITTEE RESPONSIBLE	TOPIC	MINUTE	ACTION	STATUS As of February, 2018
Doug Johnson	Development of an International Souris River Board Procedures Manual	Sep 25/09-3 Feb 27/09-10a.	Doug Johnson to coordinate and call a meeting of a Canadian team for production of a draft procedures manual. At the Feb 23, 2010 meeting, Doug reported this was incomplete.	On Hydrology Committee Work Plan
Bob Harrison Martin Graczyk Ed Eaton	Report on the spring 2009 flood.	Sep 25/09-3 June 18/09-10d.	SRFFLC to write a report on the spring 2009 flood. The report is to document what happened, provide a chronology of events, examine why the forecast (at Minot) was too high, lessons learned, and make recommendations for improvements for the future.	Completed
AEHC	Compliance with Water Quality Objectives	September 14, 2011	AEHC to recommend actions to be taken by the Board to address exceedances of water quality objectives	Closed
John Fahlman	Winter release from mid-level outlet for better water quality	June 20, 2012	J. Fahlman to check with his staff if releases could be made from the mid-level out of Rafferty Reservoir to improve water quality downstream and respond to Mike Sauer.	Closed
Flow Forecasting Liaison Committee	New Communication Strategy	June 20, 2012	The Flow Forecasting Liaison Committee will create a formal communication strategy	Completed
AEHC	New E. coli objective	June 20, 2012	AEHC will prepare a short report detailing the justification/reasons for adding E. coli to the ISRB Water Quality Objectives	Closed
AEHC and HC	Varying flow rates for winter releases	June 20, 2012	AEHC and HC will develop a plan for testing various winter release rates to determine the optimum flow rate to maintain DO levels	Closed
ISRB	Engaging the Upper Souris Watershed Association with Board activities	June 20, 2012	As an IWI Board, the ISRB would continue to seek opportunities to engage watershed associations and the public	Closed
AEHC	Terms of Reference	February 20, 2013	AEHC Co-chairs to send their TOR to the Board	Completed
Water Security Agency	90-day volume - Souris River at Sherwood	February 20, 2014	WSA will prepare an estimate of the 90-volume for the Souris River at Sherwood for March 20 meeting	Completed
ISRB	Flood event determination	February 20, 2014	The Board will determine the return period/flood event for Spring 2014	Completed
Co-Secretaries	Membership update	February 20, 2014	Co-Secretaries will send an updated list of all committees to the Board	Completed
ISRB	Communication Protocol	February 20, 2014	Board to review and approve the "Communication Protocol for Fish Kills in the Souris River on March 20, 2014	Completed
Co-Chairs	Mike Laitta's support	February 20, 2014	Co-Chairs will send a joint letter requesting the IJC for Mike Laitta's assistance.	Closed
ISRB	Potential Public Board members	February 20, 2014	Board will prepare a list of potential NGOs to establish a pool to draw public candidates for Board membership	Closed

International Souris River Board
ACTION ITEMS – progress updated June 27, 2017

PERSONS OR COMMITTEE RESPONSIBLE	TOPIC	MINUTE	ACTION	STATUS As of February, 2018
ND SWC	Next Face-to-Face Meeting	February 20, 2014	ND SWC will host the June 2014 Public and Board meeting	Completed
IJC	IWI template	June 25, 2014	Mark Colosimo will send the IWI template to H. Husband for submission of the proposed changes to the Water Quality Objectives.	Completed
ISRB Co-Chairs and Co-Secretaries	Public membership on Board	June 25, 2014	Board will prepare a list of potential NGOs to establish a pool to draw public candidates for Board membership	Completed
Dan Selinger	Determination of Natural Flows to May 31, 2014	June 25, 2014	Dan Selinger, WSC, to submit his calculations to the Board for review and approval at the Sept. 25 conference call	Completed
Manitoba Water Conservation & Stewardship	Next face-to-face meeting	June 25, 2014	Manitoba Water Conservation and Stewardship will coordinate and host the next Board meeting.	Completed
Megan Estep	Synopsis of the adequacy of the hydrometric network in the Souris River Basin	February 26, 2015	Megan Estep volunteered to provide a synopsis to the IJC regarding the adequacy of the hydrometric network in the Souris River Basin.	Completed
ISRB Co-Chairs	Request for support letter to the City of Minot NDRC application submission	February 26, 2015	Co-Chairs to review and endorse the support letter on behalf of the Board.	Completed
Saskatchewan Water Security Agency	Host the Summer 2015Public and Board meeting	February 26, 2015	Saskatchewan Water Security Agency will coordinate the Summer 2015 Public and Board meeting in Estevan, SK	Completed
ISRB Co-Secretaries	Doodle poll to set-up a webinar	February 26, 2015	The Co-secretaries will conduct a Doodle Poll to set-up a webinar for Gregg Wiche's presentation on Climate Analysis and Water Balance Report as part of the POS	Completed
ISRB Co-Secretaries	Next face-to-face meeting June 18-19, 2015	February 26, 2015	Co-Secretaries will coordinate with EC and WSA to setup the logistics for the Summer 2015 meeting in Estevan, SK	Completed
ISRB	Submit an IWI Project Proposal	February 24, 2016	Board to prepare and submit an IWI proposal to improve communication and display of the Annual Report and website.	Completed
Joel Galloway	Discrepancies of results of water quality sampling	February 24, 2016	Joel Galloway will investigate the reason for the discrepancies of the results of the joint water quality sampling between Canada and the USGS	Ongoing
Pascal Badiou	DU Nutrient Project	February 24, 2016	Pascal Badiou to present the results of the DU Nutrient Project to the Board	Ongoing
Mark Gabriel	IJC - Review Water Quality Objectives	February 24, 2016	Mark Gabriel will present the results from his review of the Souris River Water Quality Objectives	Completed

International Souris River Board
ACTION ITEMS – progress updated June 27, 2017

PERSONS OR COMMITTEE RESPONSIBLE	TOPIC	MINUTE	ACTION	STATUS As of February, 2018
ISRB Secretaries	IJC Climate Change Framework	February 23, 2017	Secretaries to add to the agenda for discussion at the June 2017 Board meeting	Completed
ISRB Secretaries	North Dakota Water Quality Project	February 23, 2017	Secretaries to add to the agenda for discussion at the June 2017 Board meeting	Completed
Souris River Study Committee	Plan of Study (POS) report	February 23, 2017	The Souris River Basin Study Committee to present its draft report at the June 2017 Board meeting	Completed
Public Working Committee	Public meetings	February 23, 2017	David Pattyson, Shelly Weppler, Debbie McMechan, and Wanda McFadyen to work on public outreach. Co-Chairs will send an email to the IJC about the creation of the Committee	Closed
Mark Lee	Whitewater Lake EA	June 27, 2017	Mark Lee to send an electronic copy of the EA for the Whitewater Lake Project in Manitoba	Ongoing
Nicole Armstrong	Picloram Exceedances	June 27, 2017	Nicole Armstrong to check and report back the Picloram Exceedances in May, June, and July	Ongoing
John Fahlmann	Water Management Projects	June 27, 2017	John Fahlman to send a 1-page summary about capital projects in Saskatchewan to the secretaries	Ongoing
Russell Boals	Terms of Reference for the Communications Committee	June 27, 2017	Russell Boals will prepare the Terms of Reference (TOR) for the Communications Committee	Completed
ND SWC	Winter 2018 Board Meeting	June 27, 2017	ND SWC will coordinate and host the Winter 2018 Board meeting in Bismarck in North Dakota	Completed

Note: When two or more meetings are referenced to an item; that indicates a carry-forward of an action item from previous meetings.