

# **Responses to the Lake Agassiz Water Authority**

## **Comments on the Draft Report on the Red River Valley Water Supply Project Needs and Options**

# L A K E A G A S S I Z

## W A T E R A U T H O R I T Y

P. O. Box 140 Carrington, ND 58421

Phone 701-652-3194 Fax 701-652-9195

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September 30, 2005

Dennis Breitzman, Area Manager  
Dakotas Area Office  
Bureau of Reclamation  
PO Box 1017  
Bismarck, ND 58502-1017

Subject: Draft Needs and Options Report Comments  
Red River Valley Water Supply (RRVWS) Project

Dear Mr. Breitzman:

The Lake Agassiz Water Authority (LAWA) has considered the information provided by its Technical Advisory Committee and reviewed the Technical Memoranda and supporting documentation prepared by Advanced Engineering and Environmental Services, Inc. (AE2S), Houston Engineering and various state agencies of North Dakota addressing the following key study areas of the Draft Needs and Options Report identified by the Garrison Diversion Conservancy District (GDCCD):

- Aquatic Needs
- Water Quality
- Cost Estimates
- Demand Calculations
- Hydrology
- Water Conservation

The LAWA would like to provide the following comments on the Draft Needs and Options Report:

### **Comments on Aquatic Needs**

It is LAWA's position that the Draft Needs and Options Report does not adequately meet the water needs of the aquatic environment as required by the Dakota Water Resources Act. It generally describes aquatic environment water needs as non-consumptive, and as a result, no water demands were estimated for aquatic environment requirements. Instead, Reclamation addresses aquatic needs by planning for a minimum conservation pool of 28,000 acre-feet in Lake Ashtabula as well as a discharge from Baldhill Dam of 13 cubic feet per second (cfs).

LAWA does support the efforts of the North Dakota Game and Fish Department to establish the following minimum streamflow recommendations in order to meet the

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## Response to Comment 1

Reclamation conducted an instream flow assessment for the Sheyenne and Red Rivers as part of the needs assessment studies. Additional analysis was completed based on the minimum instream flow recommendations from the North Dakota Game and Fish Department. This analysis is described in chapter four, pages 4-41 through 4-43 and Appendix C, Attachment 10 in the Final Needs and Options Report. However, neither the community-based flow regime developed by Reclamation nor the flow regime recommended by the North Dakota Game and Fish Department were included in any of the options. Both would require expensive infrastructure to implement, and do not appear to be viable, because a project sponsor willing to cost-share the expense has not been identified. We would reconsider this position if a stakeholder indicates a willingness to pay.

needs of the aquatic environment as part of this project for the Red River and Sheyenne River:

1. A minimum release of 23 cfs from Baldhill Dam year round.
2. A minimum spring flush of 215 cfs for a period of 48-72 hours from April 6 -10.
3. April flows shall average a minimum of 69 cfs.
4. Year round minimum instream flows of 68 cfs at Fargo on the Red River.
5. Year round minimum instream flows of 23 cfs below the Fargo intake on the Sheyenne River.

### Comments on Water Quality

It is LAWA's opinion that the Draft Needs and Options Report does not sufficiently address water quality as required by the Dakota Water Resources Act. Specifically, there is concern regarding the water quality of the Red River during low flow conditions, which would likely become wastewater effluent dominated. The water quality impacts associated with an effluent dominated streamflow could be significant in terms of both environmental impact and the feasibility of existing water treatment processes.

Current NDDH regulations restrict wastewater treatment system discharges during low flow events. Current modeling efforts do not recognize these restrictions. In recognition of the concern expressed in the previous comment regarding low flow conditions and the potential to dominate the streamflow with wastewater effluent, the impact to the hydrology modeling efforts and ultimate sizing of facilities may need to be modified.

### Comments on Cost Estimates

The Draft Needs and Options Report indicates that various estimates remain at an appraisal level (e.g., biota water treatment facility), whereas feasibility level estimates are required to request federal funding appropriations. It is LAWA's opinion that the estimates are adequate as a basis for alternative comparison and selection of the preferred alternative.

### Comments on Demand Calculations

The total water demand identified in the Draft Needs and Options Report provides a sufficient range of options to meet the regions municipal, rural and industrial (MR&I) needs during the planning period. The Bureau of Reclamation has put forth considerable effort in developing population projections and water demands for the Red River Valley. There has been a sufficient level of participation from the individual water systems throughout the data collection process to ensure that the full need has been identified. The total Scenario 2 water demand for the Red River Valley is relatively similar to the cumulative system supported water demand.

There are some individual water system demands that should be reviewed. The attached Technical Memorandum summarizes those small discrepancies.

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## Response to Comment 2

Reclamation expanded the discussion of water quality needs in chapter two, pages 2-74 through 2-83 in the Final Needs and Options Report. Reclamation addressed wastewater treatment plant impact on water quality in chapter two, page 2-84 in the Needs and Options Report. Additional water quality analyses to address the impacts on wastewater treatment plant releases on surface water quality in the Shyenne and Red Rivers and on water treatment processes will be included in the FEIS (final environmental impact statement).

## Response to Comment 3

In meetings with Reclamation, North Dakota Department of Health staff have stated that the Fargo wastewater treatment plant could release treated wastewater into the Red River under low flow conditions, so no water quality or release problems were assumed in flow analysis.

## Response to Comment 4

We agree that the estimates are adequate to compare alternatives but would need to be refined to support legislative or authorization requests from Congress.

## Response to Comment 5

The two water demand scenarios used in the Final Needs and Options Report provide adequate data to understand the relationship between alternative costs and water demands. Additional water demand sensitivity analyses may be done in the FEIS.

### Comments on Hydrology

After reviewing the information provided regarding the hydrology model of the Red River and Sheyenne River, it is LAWA's opinion that the model has been developed sufficiently to evaluate the water needs in the Red River Valley.

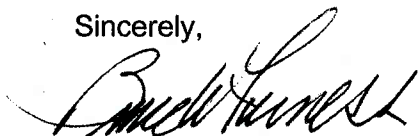
The No Action runs show significant shortages during a drought period similar to the 1930s. Table 3.7.4 of the Draft Needs and Options Report tabulates these shortages. This table does not; however, point out one very important factor. Users downstream from the Fargo/Moorhead/ West Fargo metro area rely on return flows from these cities to get them through the drought period. Without these return flows, the cities of Grand Forks and East Grand Forks would show significant shortages. Similar results for the cities of Drayton and Grafton exist. Without return flows from the Fargo and Grand Forks areas, these two cities would show shortages.

### Comments on Water Conservation

Reclamation has generally acknowledged and incorporated the suggestions arising from the comments submitted during the review of the Draft Water Conservation Potential Assessment (WCPA) Report. While the revised values will require the systems to put forth a considerable effort to develop and invest in water conservation programs, the identified water savings reported in the Final WCPA Report and used to calculate water demands as part of the Draft Needs and Options Report appear to be reasonable and attainable.

Reclamation has done an outstanding job on the Draft Needs and Options Report by providing a full range of options for the Red River Valley Water Supply Project. We look forward to working together to provide a reliable water supply for the Red River Valley by completing the Red River Valley Water Supply Project.

Sincerely,



Bruce Furness  
Chair

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## Response to Comment 6

Thank you. We agree.

## Response to Comment 7

In meetings with Reclamation, North Dakota Department of Health staff have stated that the Fargo wastewater treatment plant could release treated wastewater into the Red River under low flow conditions, so no water quality or release problems were assumed in flow analysis. We assumed that return flows would be released and modeled these releases based upon historic data.

## Response to Comment 8

Thank you.



## TECHNICAL MEMORANDUM

**To:** Al Grasser, P.E., Chair  
Lake Agassiz Water Authority (LAWA) Technical Advisory Committee (TAC)

**From:** Nate Weisenburger, P.E.

**Re:** **Comments on Demand Calculations**  
**Draft Report on Red River Valley Water Needs & Options**

**c:** Dave Koland, GDCD

**Date:** September 28, 2005

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The comments provided in the following technical memorandum are intended to address the demand calculations (population projections and water demands) that were developed for the water systems located throughout the Red River Valley and reported in Section 2.0 and Appendix A of the Draft Report on Red River Valley Water Needs and Options (Draft Needs and Options Report) prepared by the Bureau of Reclamation (Reclamation). It is recognized that Reclamation has put forth a considerable effort in developing population projections and water demands for the Red River Valley. Likewise, the level of participation that Reclamation has requested from the individual water systems throughout the data collection process is appreciated. As a result of the associated work, the total Scenario 2 water demand for the Red River Valley is relatively similar to the cumulative system supported water demand. As such, many of the comments included herein may not significantly impact the overall Scenario 2 results. However, from the perspective of the individual systems, particularly the smaller systems included in the study, these comments could have a substantial impact on the projected need and selection of a preferred alternative. Ultimately, the breakdown of the overall water demand will also dictate the financial commitment that may be required from each user to participate in the selected alternative.

In its capacity as the representative for the water systems located in the proposed service area for the Red River Valley Water Supply (RRVWS) Project, LAWA should respectfully request that Reclamation address the items identified in this technical memorandum through revisions to the draft Needs and Options Report, the preparation of an addendum, or during the finalization of the Environmental Impact Statement (EIS).

### **Population Projections – General Report Content and Organizational Comments**

In review of Chapter 2 of the Needs and Options Report, it was noted that population information associated with the total service population of the project was not provided in one dedicated table. Although the proposed municipal and rural service populations could be derived by combining information included in various locations throughout Section 2.0 and Appendix A, it would be helpful if a more cohesive presentation of data and a corresponding discussion be provided. For example, it would be helpful if Section 2.3 were expanded to provide additional tabular data and information necessary to properly identify the projected



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## Response to Comment 9

In addition to table 2.3.1 (County Population Projections) and table 2.3.2 (Municipal Population Projections), Reclamation included table 2.3.3 (Service Area Population Projections Used in Analysis) on page 2-26 in the Final Needs and Options Report.

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service population of the project. A possible approach would be to summarize the population projections in a table consistent in format to the summary tables in Section 2.11.

In Section 2.3, population projections were identified for both North Dakota and Minnesota counties located in the Red River Valley. However, a portion of the population reported was not considered in the development of the RRVWS Project. Furthermore, several of the municipal population projections reported are presently served by rural water systems, or may be in the future. Therefore, the presented total does not coincide with the population used to calculate the "municipal water demand" later in the report. It would be helpful if the text of the document clarified these two issues so that the reader can more easily relate the presented information to the population that the project will actually serve.

The current section does not quantify rural water system populations, explain how the presented populations relate to the service populations, or identify how the proposed service populations were developed. It would be helpful if a summary of rural populations being served by the project were provided directly in Section 2.3. Useful information would include a tabulation of Reclamation vs. System developed projections, which is detailed enough to identify the "future consecutive users" as outlined in Table 2.4.5 and the associated populations under each Scenario. In addition, a discussion regarding how Reclamation handled the future/anticipated rural water system consecutive user populations under each Scenario would be constructive. Reclamation appears to have subtracted these populations from the total rural population reported. It should be noted that for Scenario 2, this is not what the systems supported, and further information regarding this issue is available in subsequent comments. In addition, it would be helpful if all rural water system tables throughout the entire Section 2.0 were expanded to show consecutive user information (i.e. Horace, Harwood, Cooperstown, etc.).

#### **Population Projections – Methodology/Data Exclusions/Comments**

LAWA should be pleased that Reclamation has recognized and utilized the municipal population projection information that was submitted throughout the data collection process for use in Scenario 2. It should be noted that while the actual projected population reported for the City of Moorhead is consistent with City projections (58,421), it is anticipated that the City of Moorhead will also serve an additional 6011 people (total = 64,432) from the City of Dilworth and the Americana and Oakworth Townships. This population was recognized in other areas of the report and also appears to have been included in the City's respective water demand calculations. Inclusion of an additional line in the Tables provided in Section 2.3 and text explaining the intent to serve the consecutive users should provide clarification on this issue.

Some inconsistencies appear to remain between the population projections that Reclamation utilized for Scenario 2 and those supported by the various rural water systems and potential consecutive users. The inconsistencies are identified as follows:

- In August of 2004, the City of Horace submitted a letter regarding its future populations projections. The City indicated that it was planning for a much higher 2050 population projection of 15,000 as compared to the 1,950 and 3,132 estimates that were reported in the Draft Needs and Options Report for Scenarios 1 and 2, respectively. The letter also suggested that this population be considered separately from Cass Rural Water User District (CRWUD), which could potentially serve all or portions of the City of Horace by year 2050.

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## Response to Comment 10

The water demand analysis, as described in the Draft Needs and Options Report, was not changed in the Final Needs and Option Report. However, your specific concerns are noted and will be considered in future Red River Valley Water Supply Project analysis during final engineering (see comments below):

1. Revised Future (2050) Population Estimates (Lake Agassiz Water Authority - Advanced Engineering and Environmental Services, Inc. comment) – Advanced Engineering provided revised population estimates for the water user projections.
  - a. Increase City of Horace from 3,132 to 15,000
  - b. Increase Cass Rural Water District from 21,048 to 37,168 (includes increase to Horace)
  - c. Increase Dakota Water Users from 2,600 to 4,078
  - d. Increase Ransom-Sargent Water Users District from 2,673 to 2,915
  - e. Increase Southeast Water Users District from 7,500 to 9,993
  - f. Increase Traill County Water Users from 2,800 to 6,950
  - g. Increase Walsh Rural Water District from 3,160 to 4,056
  
2. Water Demand Estimates (Lake Agassiz Water Authority - Advanced Engineering and Environmental Services, Inc. comment) – Advanced Engineering provided comments regarding specific water demands estimated for the following water systems.
  - a. City of Drayton – erroneous peak day data.
  - b. City of Langdon – Monthly historic data impacted by rural water system; prefer use of monthly planning level.
  - c. City of Larimore – peak day data not available; prefer using planning levels.
  - d. City of East Grand Forks – Industrial water use impact data; monthly planning levels preferred.
  - e. Cass Rural water Users District – Unaccounted for water percentages revised; prefer planning levels for monthly water demand be used in the analysis.
  - f. City of Horace – The rapidly growing urban population will change per capita water use.
  - g. Dakota Water Users – New peak day water demand data are available.
  - h. City of Grand Forks-Traill Water District – Excessively high maximum month water demands were recorded in 1997. More reasonable monthly data should have been used in analysis.
  - i. Ransom-Sargent Water Users District – Limited historic data are available since it is a new system; planning estimates should be used in analysis.
  - j. Traill County Rural Water Users – Should use 80 gallons per capita per day. Peak day demands for system analysis are provided.
  
3. Consecutive Industrial Water Users (Lake Agassiz Water Authority - Advanced Engineering and Environmental Services, Inc. comment) – Advanced Engineering provided comments on specific consecutive industrial water users whose impacts on a municipal supplier was not correctly estimated. Industries are listed below:
  - a. City of Grafton and Alchem
  - b. City of East Grand Forks and American Crystal Sugar
  - c. Traill County Rural Water Users and American Crystal Sugar

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- It appears that Reclamation intended to incorporate the rural water system supplied population projections that were submitted in the July 18, 2003 correspondence previously referenced. In addition, it appears that several comments pertaining to the possibility of consecutive users and how they should be incorporated were either not acknowledged or were addressed in an unintended manner. Furthermore, additional information was submitted for select systems in the subsequent review effort associated with water demand calculations. These suggestions may have also been overlooked in some cases. A table provided below provides the population projections that are preferred by the systems for incorporation into Scenario 2.

Rural System	2050 Pop. Projection
Agassiz Water Users District	5,300
Barnes Rural Water District*	4,897
Cass Rural Water Users District*	21,048
Horace*	15,000
Harwood	1,120
<b>TOTAL</b>	<b>37,168</b>
Dakota Water Users	2,600
Cooperstown	1,053
Binford/Sibley/Hannaford	425
<b>TOTAL</b>	<b>4,078</b>
Grand Forks – Traill Water District	15,000
Langdon Rural Water District	2,900
North Valley Water District	8,900
Pembina	N/A
<b>TOTAL</b>	<b>8,900</b>
Ransom-Sargent Water Users District*	2,915
Southeast Water Users District	7,500
Hankinson	1,058
Lidgerwood	738
Wyndmere	697
<b>TOTAL</b>	<b>9,993</b>
Traill County Water Users	2,800
Hillsboro/Galesburg	1,930/154
Mayville	2,066
<b>TOTAL</b>	<b>6,950</b>
Tri-County Water District	2,800
Walsh Rural Water District	3,160
Minto	896
<b>TOTAL</b>	<b>4,056</b>
<b>TOTAL RURAL POP.</b>	<b>104,957</b>

\* Revised Subsequent to July 18, 2003 Correspondence

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Reclamation's intention to represent the systems by developing a second set of water demand calculations based on user-supplied and supported information (Scenario 2) should be commended. Likewise, LAWA should continue to urge Reclamation to work with the various systems throughout the Red River Valley by recognizing and/or incorporating the above comments and suggestions into Scenario 2 to the greatest extent possible as part of either a revision to the Needs and Option Report, the preparation of an addendum to the Needs and Options Report, or during the finalization of the EIS. This will ensure that the users are supportive of their independent levels of participation, especially in regards to the potential financial commitment that will be required to complete the selected RRVWS alternative.

### **Water Demands**

In the fall of 2003, Reclamation submitted water demand calculation spreadsheets to the various systems throughout the Red River Valley for review and comment. Many systems responded by providing comments regarding the interpretation of data, filling in data gaps, and recommending methodology changes to more effectively represent their respective water demands. As a result of this effort, Reclamation adopted a considerable number of methodology changes suggested by the users, and subsequently agreed to develop Scenario 2 water demands to reflect differences between Reclamation supported water demands and water demands supported by the systems. As stated previously, Reclamation's effort in developing Scenario 2 water demands is recognized and appreciated, as it represents a willingness to represent the perspectives of individual system(s). In addition, it is also commendable that Reclamation considerably modified the water demand calculation methodology in response to the previous review effort.

The following discussion is intended to identify some remaining inconsistencies that were noted between the water demand calculations supported by the systems and Scenarios 1 and 2, which were included in the Draft Needs and Options Report. It should be noted that several of the apparent inconsistencies impact the assumption by Reclamation that the per capita water demands for both Scenario 1 and Scenario 2 are the same.

The remaining inconsistencies are generally associated with the following:

- Systems adopted the use of planning level water demands for maximum month water demands when historical data was erroneous, data seemed unreasonable due to anomalous operating conditions, and/or did not exist.
- Systems identified the exclusion of existing industrial water users by Reclamation.

The systems request that Reclamation acknowledge the issues presented below as part of revisions to the draft Needs and Option Report, the preparation of an addendum, or during the finalization of the EIS. Again, the impact associated with the suggested changes does not appear to be significant to the overall water demands, but it is relatively significant to the individual systems. If Reclamation revises the hydrology model to address other identified concerns, it would seem appropriate to incorporate this information into the project at that time. However, if it is not necessary to revise the hydrology model, LAWA should request that Reclamation incorporate the comments in some other manner.

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The following discussion is only intended to identify those systems with noted discrepancies. For more information regarding the details of how the users would like to be considered, please refer to comments submitted on a system-by-system basis as part of the water demand calculation spreadsheet review effort previously identified.

#### *Planning Level Water Demand Utilization*

A detailed review of the historical data that was used to develop the maximum month and peak day water usage was completed by various systems. As part of this review, some systems identified data that either overestimated or underestimated the maximum month and peak day water usage. Instead of relying on historical information (or lack thereof) in these cases, planning level demand values that seemed more appropriate were identified by the systems.

In general, exceedingly high and low peak day demand values were replaced with planning demands and peaking factors. For winter month maximum month values (November through April), several water systems replaced any values less than 80 gallons per capita per day (gpcd) with 80 gpcd or greater. Likewise, several systems identified maximum summer (and in a couple of cases, winter) month values that were unreasonably high and either selected the second highest monthly water usage rate or used a planning number based on historical information from comparative systems.

A few of the systems did not have adequate historical data (or noted erroneous data) to provide a reasonable range of maximum month water use information. These systems adopted planning numbers based on historical information from similar systems to complete their respective water demand calculations. The following list of systems utilized planning numbers to some degree in their analysis.

- The City of Drayton – erroneous peak day information was originally provided. Corrected information was not available during the original water demand calculation review; however, the correct information has since been obtained and is attached to this technical memorandum. Digital copies are available upon request.
- The City of Langdon – consecutive rural water system impacted historical data; monthly planning levels were adopted.
- The City of Larimore – peak day information not available; planning levels utilized.
- The City of East Grand Forks – Industrial water use impacted historical data; planning levels substituted where appropriate.
- Cass Rural Water Users District – unaccounted for water percentages revised; planning levels used for maximum month values where appropriate to account for rapidly growing urban population and changes in water use since 1980s drought period.
- The City of Horace – rapidly growing urban population anticipated to result in significant water use changes.
- Dakota Water Users – system supplied a peak day demand estimate to fill data gap and adopted planning levels, most of which were based on historical information, for maximum month values.



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- Grand Forks – Traill Water District – excessively high maximum month levels were recorded with the start-up of the new membrane system in 1997. These values were ignored and more reasonable maximum month levels were identified.
- Ransom-Sargent Water Users District – limited historical information was available since the system is a new water system. Planning values were selected to fill data gaps.
- Traill County Rural Water Users (system adopted a minimum winter maximum month level of 80 gpcd and provided assumptions to estimate a peak day water use).

***Consecutive Industrial Water Users***

During the review of the water demand calculation spreadsheets, several systems noted that Reclamation did not have information (or had incorrect information) on consecutive industrial water users that their systems were serving. As a result, some of the systems serving major industries compiled the appropriate historical water use data, revised the water demand calculation spreadsheets from Reclamation accordingly, and submitted this information to Reclamation. However, after review of the Draft Needs and Options Report, it appears that for some systems, this information was not incorporated into Reclamation's water demand calculations. The respective systems and associated consecutive industrial water users are listed below.

- The City of Grafton and Alchem.
- The City of East Grand Forks and American Crystal Sugar.
- Traill County Rural Water Users and American Crystal Sugar.

It should be noted that much of the information supplied by the systems in the original water demand calculation comments could also impact water demand calculations under Scenario 1. Each of the above systems respectfully requests that Reclamation revisit the previously submitted comments on the water demand calculations and incorporate the suggested planning levels, consecutive industrial water user information, and corrected historical data into its water demand calculations for Scenario 2 (and Scenario 1, as appropriate). In some cases, it is recognized that adopting the suggested changes will be relatively insignificant to the overall water demands for the entire region. However, individual users are concerned that if this information is not reported according to their input, systems may be required to participate in a preferred alternative at a level that is either greater or less than what is actually necessary.

In addition to the comments provided above, it appears that Reclamation's methodology for calculating the annual water demand for rural systems with future consecutive users is not consistent for Scenarios 1 and 2. In Scenario 1, Reclamation calculated rural system and potential consecutive user annual demands separately and then added them together. In Scenario 2, the method Reclamation used cannot be discerned from the information provided in the report and Appendix A, and clarification on the methodology should be requested. It should be noted that the systems support the method applied to Scenario 1, whereby the rural system and potential consecutive user annual demands are calculated separately and then added together.

It would be insightful if the system summaries included in Section 2.4 were expanded so that all individual system discussions include the same information. Information that would assist

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individual systems to better understand the calculation of water demands is provided below. It should be noted that Reclamation has provided some of the following information, all or in part, for each of the systems already.

- Maximum annual, maximum month, and peak day water demands, including when they occurred;
- Identification of gaps in historical data and the assumptions that were made to fill such gaps;
- A summary of consecutive users; and,
- Any other special circumstances that might pertain to a particular water system (i.e. the City of Moorhead intends to serve the Oakport and Americana Townships and the City of Dilworth, Cass Rural Water Users District is growing in urban population, which is resulting in continually increasing peak day estimates, Barnes Rural Water District serves a portion of the Ransom-Sargent Water Users District, etc.)

Finally, it would be helpful if the tables throughout Section 2.0 that contain water demand information also contain a column(s) for population projections. The revised tables would assist the reader in identifying water use trends based on the size of the system(s) without having to refer to multiple pages and tables to compare the information.

#### **Closing Comments**

In addition to the comments noted above, AE2S has noted a number of grammatical and correlation/labeling issues throughout Section 2.0, including misspelled names, inconsistencies between table headings and table content, misrepresentation of the type of demand being discussed, etc. It is recommended that Reclamation review the Section to rectify these items. If Reclamation prefers, AE2S could provide these comments under separate cover.

Reclamation is commended for the considerable effort that was expended to compile historical water use information and calculate the associated water demand projections. As a result of Reclamation's efforts, the overall needs of the Red River Valley as reported by Reclamation are comparable to those developed by the systems. On an independent system basis, it appears that some calculation discrepancies, if not remedied, could impact the level of participation of individual systems. As stated throughout the technical memorandum, LAWA should respectfully request that Reclamation address the items identified herein either through revisions to the draft Needs and Options Report, the preparation of an addendum to the Draft Needs and Options Report, or during the finalization of the EIS.