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Report of Public Response

Potential Modification of Rules Related to Determination of Fully Appropriated Basins, Subbasins, or Reaches

FINAL REPORT
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Prepared For:
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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Department of Natural Resources (DNR) commissioned this report to document public feedback about proposed revisions to state rules relating to the determination of fully appropriated basins, subbasins, or reaches. The public feedback was gathered in advance of Public Hearings tentatively scheduled for late summer 2013. Public feedback was primarily gathered through six (6) public meetings conducted in Norfolk, Valentine, Scottsbluff, Kearney, Beatrice, and Lincoln, Nebraska during May 2013. Other feedback channels were also available through the DNR website, paper forms that could be mailed/emailed/faxed, and other mailed/emailed/faxed communications. Nearly 100 individuals attended the public meetings. DNR received 24 pieces of written feedback from individuals (n = 12) and from 19 organizations (i.e., some of the 12 pieces of written feedback represented more than one organization). Responses were categorized as those that were primarily questions (*n* = 172) and those that were primarily comments (*n* = 128). More questions and comments were related to the methodology than any of the other categories within their areas (questions about methodology = 82; comments about methodology = 35). Other categories of questions that were popular included *Questions Related to Rules Sections* (*n* = 45), and *Impact on Basin Water Planning* (*n* = 24). Other categories of comments that were popular included *Comments Related to Rules Sections* (*n* = 28), *Impact on Basin Water Planning* (*n* = 23), *Relationship Between Rules and Methodology* (*n* = 12), and *Environmental Considerations* (*n* = 12).

INTRODUCTION

The University of Nebraska Public Policy Center (PPC) has documented public feedback regarding the proposed revision to state surface water rules relating to the determination of fully appropriated basins, subbasins, or reaches. The Nebraska Department of Natural Resources (DNR), in its statutory role, has developed and proposed rule revisions *(Appendix A: Draft Rules Title 457, Chapter 24)*. The proposed rule revisions have been a part of a process that was initiated in 2009 *(Appendix B: Timeline for Assessment and Potential Modification of Department's Rules Related to its Determination of Fully appropriated Basins, Subbasins, or Reaches*). Further, although not a proposed statutory component of the proposed rule change, DNR also released a draft of the methodologies used to make the annual basin evaluations in the coming year (*Appendix C: Draft Methodologies*). These draft methodologies were released to provide insight into how the rules would be applied.

Public response to the proposed rule revisions were made available through several channels:

Public Meetings

- Public meeting verbal feedback during the six (6) public meetings held throughout the state on May 13-16 (*Appendix D: Public Meeting Notifications*)
- Public meeting written feedback on paper forms handed out to all attendees

Other Written Feedback

- Feedback received through the DNR webform established specifically for comments about the proposed revision on the DNR website
- Feedback received by DNR through channels such as mail, email and fax

PURPOSE AND APPROACH

The purpose of this report is to capture, categorize, and summarize the public feedback regarding the proposed revision to state surface water rules relating to the determination of fully appropriated basins, subbasins, or reaches. This document incorporates all feedback received from April 8 through June 7, 2013. The two PPC staff authors, who developed this report, attended all meetings, and read all written communications.

This report provides the authors' summarizations of public feedback and DNR responses solely for information purposes. The intent is not to provide a transcription or exact representation of verbal or written comments. This report should not be construed as a statement of DNR policy or intentions. Any errors in representation or of a factual nature are solely attributable to the authors.

Feedback from Public Meetings

Two PPC staff attended all public meetings to capture verbal comments. Both staff members recorded notes during the meetings. The public meetings were also recorded to assist the staff in capturing the comments

Each meeting was conducted in a similar fashion. Attendees were provided handouts of the revised rules, the public comment form, and a survey about confidence in a variety of water-related organizations and interest in public participation (relevant results reported here). Attendees were also asked to provide their name, affiliation, and email on a sign in sheet. Jesse Bradley, Division Head of Integrated Water Management for DNR, gave a PowerPoint presentation (*Appendix E: Overview of New Rules for Determining Fully appropriated Basins* and *Appendix F: Summary of Narrative Presentation by Jesse Bradley*), and then invited comments and questions. Brandi Flyr, Integrated Water Management Coordinator, also attended the meetings and assisted during the comments and questions period.

The verbal responses generally fell into two overarching types: those that were *questions* asking for clarification or additional information, and those that were *comments* about the revised rule and the process. In some cases, where the individual's response might be considered both a question and a comment, it was categorized as both.

Other Feedback

PPC staff were provided copies of comments received through other channels (i.e., mail, email, webform, fax). All written feedback is assumed to represent comments, since there was no immediate opportunity for DNR to answer questions. Much of the written feedback included multiple points. The authors included all points that they identified in the results, meaning that more complex communications have numerous points that are represented.

RESULTS

Breadth of Participation

The public response process elicited the participation of over 100 persons and organizations, representing a variety of interests.

Numbers of Participants

In terms of numbers, the public meetings drew variable response; from a low of three (3) in Valentine to a high of 34 in Lincoln (Table 1). 24 pieces of written communications were received from 24 individuals (*n* = 12) and on behalf of 19 organizations (some letters represented feedback from several organizations).

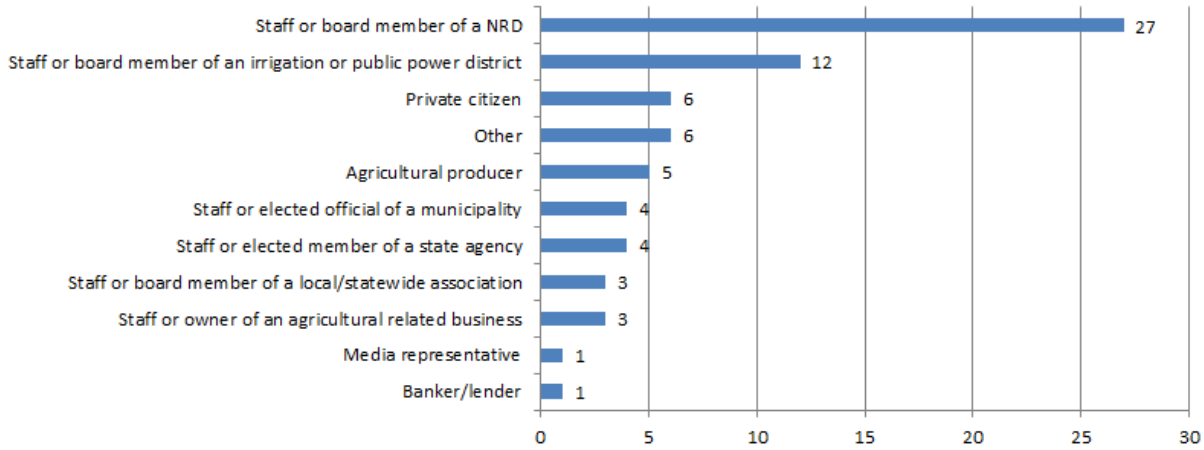
Table 1: Public Meeting Attendance

Meeting Location	**Persons Attending**
Norfolk	15
Valentine	3
Scottsbluff	24
Kearney	11
Beatrice	5
Lincoln	34
	92

Affiliation of Participants

A survey distributed at the public meetings asked participants to indicate which category best represented their affiliation. Although the survey asked participants to check only one affiliation, five (5) respondents checked multiple. The majority of those attending the public meetings were staff or board members of a Nebraska Resource District (n = 27) (Figure 1).

Figure 1. Participant Affiliation



Other affiliations offered were: Attorney for NPNRD, NPVWA, NPVIA, and producer; Consultant for North Plate NRD; Multi-state/federal organization staff; National Parks Service employee; None of the above; Staff of non-governmental organization; Wyoming resident.

The affiliation of individuals who provided feedback through the mail, email, webform, or fax was not collected.

Categories of Questions and Comments

Most of the feedback were deemed to be questions (*n* = 172) rather than comments (*n* = 128). Within both the questions and comments categories, most feedback was related to the draft methodology to make annual basin evaluations (questions, *n* = 82; comments, *n* = 35). Frequency of categorized feedback is displayed in Table 2, in order of most to least.

Table 2. Frequency of Public Feedback within Categories

Participant Questions	**172**
Questions Related to Methodology	82
Questions Related to Rules Sections	45
Impact on Basin Water Planning	24
Plan for Public Response to Rules Change	8
Impact of the Rules Change	7
Miscellaneous	4
Why the Rules Change	2
Participant Comments	**128**
Comments related to Methodology	35
Comments Related to Rules Sections	28
Impact on Basin Water Planning	23
Relationship Between Rules and Methodology	12
Environmental Considerations	12
Clarity in Rules	9
Opportunities for Public Input	7
Timing of Rules Change	2

Participant feedback and DNR responses during the public meetings are paraphrased, rather than intended to be transcripts. First, participant questions are provided, followed by participant comments. Written comments are asterisked (*) and are not followed by any DNR response. The sub-categorizations are ordered to enhance readability and flow, rather than by popularity (as was displayed in Table 2, above).

Participant Questions

WHY THE RULES CHANGE

What was the motivation for the rules change?

The motivation behind the rules change center on three aspects: the need to determine the difference between fully and over appropriated basins, a legal challenge to a fully-appropriated designation and the ruling of the Nebraska Supreme Court reversing this designation, and the need for a seamless transition to water planning. In 2009, the department was finalizing their integrated management plans (IMPs) with the NRDs located in the over appropriated portion of the Platte River Basin; one component of the IMPs is the differentiating between over appropriated and fully appropriated. While analyzing the current rules and the methods for the Department's Annual Evaluation, it was determined the current rules did not align with the current integrated management plans. The NRDs were interested in working with the Department to look at different methods that could be utilized. During the same time, a preliminary designation in the Niobrara water basin was challenged; the ruling of the Nebraska Supreme Court reversed the designation and found the rules to be ambiguous in certain circumstances. Work under LB962 (2004) has been progressing for nearly a decade with focus on how to make the Department's Annual Evaluation align more seamlessly with the subsequent planning processes.

What is the purpose of this rules change? With the Supreme Court able to overturn rules and laws, where does final judgment lie?

In general, the purpose of the rules is to provide information to support proactive planning; an additional element of the evaluation is to provide a forecast for future development and future water use. NRDs in the Lower Platte Basin are starting to develop a voluntary basin-wide management plan to determine future needs of water supplies and water uses.

IMPACT OF THE RULES CHANGE

If Lower Platte Basin was fully appropriated and the city of Lincoln flexed their senior water rights, what affect would this have on the Loup and Elkhorn basins?

This would not have an impact on this analysis. Assumptions on how this would affect an IMP cannot be made without knowing the goals and objectives of the IMP. In statute, there are various controls available and it is those controls that would potentially have an effect.

The Lower Niobrara has one year remaining on their full-appropriation designation before it is reevaluated. Will the new rules remove or amend this timeline?
That will be at the discretion of the DNR director. Information to support the analysis is currently being collected; if the analysis does not occur, this information will still prove useful for planning.

What are the implications for the Loup and Elkhorn if the city of Lincoln calls upon their senior water rights?
This call would not have changed the outcome of this analysis; the analysis incorporates Lincoln and Omaha's consumption and instream flow demands. Impacts of the call would have been administrative and to junior water users. This approach, outlined in the rules, does not guarantee there will not be water shortages; instead, it focuses on an overall balance of water supplies and water uses.

Will this evaluation provide the NRDs with information as to what wells could be shut down to provide a quick response in times of water scarcity?
No. The evaluation is not looking at regulation of water supplies; instead, the focus of the rules is to determine when to start planning and water management plans to protect existing water users.

How would or could the rules change affect the over appropriated basin?
The rules change would affect the over appropriated basin in the ways the NRD and DNR choose through their joint plans. The DNR will work with the NRD to develop goals and objectives based on the available information on water supplies and water uses. If an agreement is not reached, no plan is developed and the issue would go to the Interrelated Water Review Board; this action has never been needed as the NRDs and DNR have always been able to develop an amicable IMP. Work with the NRDs in the over appropriated basin will continue to develop an IMP and identify goals for the next incremental period.

Would development – industrial, commercial, domestic – prior to a designation be regulated differently than development that comes after a fully appropriated designation?
Possibly. These are decisions that would be determined through the integrated management planning process.

Does the rule change have any significant impact on instream flows?
Instream flow appropriations will be incorporated into this evaluation. The only entities that can currently hold instream flow appropriations in Nebraska are the Game and Parks Department and the NRDs.

PLAN FOR PUBLIC RESPONSE TO RULES CHANGE

Is it possible for the rules to change?
Yes, the DNR wants input on the rules. Substantial thought and collaboration has taken place throughout the development of these rules. Thoughts and comments are highly desirable as they will be incorporated into the final draft of the rules.

Can the June 7, 2013 deadline for comments be extended?
Public meetings of the Platte Over appropriated Committee have been held in North Platte with the five NRDs that initiated the study; stakeholder meetings have been held to inform other NRDs of any and all developments. The rules change was expected to be initiated a year ago; however, work on the process was necessary and the timeline was delayed. The Lower Platte Basin will be reevaluated this year, causing a greater sense of urgency to complete the rules change and complete the evaluation with the new rules.

Is a redline version of the draft rules available?
The only things that remains in the revised rules are section 3 (the hydrologically connected area), and the information considered was updated. Thus a redline version would not likely be very useful given the wholesale changes that have been made.

Is the DNR still open to minor tweaks to the rules to support the Nebraska Supreme Court Decision?
These are the draft rules; the DNR is looking for comments to improve these rules. If the new rules cannot be adopted in time for the annual evaluation, the current rules will be used.

When will use of this concept begin?
The intent for moving forward is to compile comments from the question and answer meetings until June 7 at which point necessary modifications to the rules or methods will be made. Public hearings will be held during the end of summer to determine if these rules should or should not be adopted. If adopted, the current rules would be replaced during the final quarter of 2013, likely in December.

Will these models be integrated into the 2012 evaluation?
Further investigation of the data would need to be done to specifically answer that question. The analysis this year will use previous analytical tools in areas, where applicable. Moving forward, groundwater models will replace these analytical tools.

How are public hearings going to be conducted? Where will they be held?
An attorney for the DNR will likely handle the hearings. There will likely be more than one hearing throughout the state; however, nothing has been finalized.

Can an additional bullet be included in the PowerPoint presentation slide deck to acknowledge precipitation and recharge on the total basin water supply slide?
Supply takes into account the water supply that would be available if no consumption occurred; in doing so, it might be helpful to clarify this point.

IMPACT ON BASIN WATER PLANNING

How will this affect those working toward establishing a voluntary IMP?
Implications can be found in Section 01.002 B of the rules. The NRD would establish a management area for hydrologically connected waters; the NRD would have three (3) years to establish a management plan after a designation is made. The management process will allow a NRD to parse off junior users if a fully appropriated designation is made, effectively protecting existing users.

Is there the potential for a quick response to satisfy needs downstream?
The Department would not set any such requirement, however this could be worked out through a basin-wide plan.

If, in the future, a basin becomes fully appropriated and Lincoln institutes a call for senior water rights, would an IMP be necessary to transfer water to other municipalities?
That would be the decision of the local NRD.

The State of Nebraska is considering participating in the J2 Return Project, could some of this water be utilized to offset some demands if an NRD choses to participate with the state in this project?
The Twin-Platte NRD, Tri-Basin NRD, and Central Platte NRD have been brought into this project; the DNR and those NRDs have agreed upon terms to share this water. The first increment of the Platte IMPs is focused on locations designated by the Platte River Recovery and Implementation Program, and the next will look at state flow and appropriation of the system to mitigate post-1997 uses.

Will a cap be placed on annual water surplus?
No, there is not currently a cap on annual water surplus as that did not come out of the evaluation and the assessment completed by the consultants. Usable supply caps may need to be recognized for years similar to 2011.

The current rule seeks to be built on the premise that people should not be encouraged to put large investments in irrigation without having the expectation that the water will be available for an economic use. The new concept seems to abandon this approach. Is this correct?
No, this is just being done by a different means. The new rule looks at water supplies to determine if there is enough water to support the use or not. The amount of water necessary to support the usage will be dependent upon the type of water needed: groundwater or surface water. New surface water permits are made aware they are subject to prior appropriations and do not guarantee them anything in the future.

The Central Platte NRD has a pending application for surface water appropriated for D680 and D680-R in which they propose to change the purpose of the use of certain appropriations of the six mile ditch company and the 30 mile canal from irrigation and incidental underground water storage to instream

use by direct surface water return. My understanding is former surface water users will be supplied with ground water to offset their loss of surface water appropriations. How will groundwater wells that have been or will be drilled affect the methodology in determining downstream obligations to meet the demands of the new wells?
The methodology will be used in coordination with the NRDs in the overappropriated basin to develop this process and technical analysis aimed at identifying the difference between current and fully appropriated levels. Information is made available to outline the activities in the Platte River Basin. These Rules are intended to be used to develop information on water supplies and water uses in close collaboration with the NRDs in the over appropriated basin and help establish goals and objectives in the next increment of the IMPs. The rules are not meant to regulate or permit activities; they are about proactive planning to protect current water users.

Do any of the NRDs have mandatory meter installation?
Yes, some of the NRDs currently have mandatory metering on some wells; many NRDs have mandatory metering requirements for the development of future wells. The entire Republican Basin is metered, nearly all of the Panhandle is metered, and the Lower Elkhorn is beginning to instill mandatory metering on all new wells.

Currently, the DNR only manages senior and junior surface water rights and cannot administer groundwater wells; how is the DNR going to deal with this?
Details can be considered through the IMP process as to what is desirable. There is no requirement for an NRD to put requirements on existing users that are in place at the time of a designation; users entering the system after a designation could be considered differently.

The city of Lincoln has a permit for 110 million gallons of water per day; the current consumption per day is around 140 gallons per capita. Through conservation, the city of Lincoln is extending the period of time before it needs to request more water. Will the permit for 110 million gallons be protected?
Groundwater consumption for municipal water system with unique water permits will be handled in a similar way. Large municipalities have acquired a right inclusive of future water needs. The new rules are planning to recognize those future water needs.

Was the original senior water right call for Lincoln for surface water?
The Department only administers for surface water rights.

How is DNR handling surface water rights that are inactive?
The DNR is continually working on field investigations and has information regarding mapped water right locations. In the new rules, most surface water rights have a netting effect as they are taken into account in both water supply and water demand. Thus, inactive surface water rights would not have a significant effect on the analysis.

Will new uses for development – instream flow, hydropower, irrigation, etc. – downstream of Lewellen be incorporated into the formula to determine the amount of downstream demand that is charged to the area above Lewellen?
Through the fully appropriated evaluation, per statutory regulation, future development is assessed; this evaluation is informative and is not used to make any determinations.

Why are downstream depletions and downstream pumping demands assigned or proportioned upstream when the upstream NRD has little to no control on downstream pumping or demand?
The new rules rely on providing information. The technical data identifies how much water is in the system and what proportion of that water supports downstream demand; the rules seek to identify this in the process and recognize where water originates and where it is consumed.

Do downstream depletions for surface water and groundwater affect upstream NRDs?
It does not have to affect the upstream NRDs; it affects the planning of downstream NRDs. Necessary additional actions by upstream NRDs will be determined through a collaborative effort between local NRDs and the DNR.

The methodology points out that the North Platte NRD has a vested interest in monitoring and participating in the planning processes of downstream NRDs.
Downstream users are not perceived to have a significant impact on upstream basins. These conversations would be beneficial during the basin-wide meetings and would best be addressed through existing planning efforts.

Should upstream NRDs have some say in the planning process of downstream NRDs since downstream management decisions to reach fully appropriated designation or keep them under fully appropriated might have an impact on the upstream NRD in a time-delayed fashion? I contend yes. If so, can they help us get into that process?
A basin-wide plan in the Lower Platte is being developed through a coalition of the seven (7) NRDs; the first action of the this group, inclusive of the DNR was to invite all potentially effected NRDs, including the North Platte NRD to participate in this planning coalition. The North Platte NRD chose not to participate; they continue to have an open invitation to join the coalition.

The incorporation of downstream demands gives upstream NRDs a perceived standing in the management plans of downstream NRDs as their water use can potentially affect the upstream NRDs water appropriations. Do upstream NRDs need to adjust their IMP in accordance to downstream NRDs water supply?
This is exactly why there was a basin-wide plan; all those provisions were outlined in this basin-wide plan. General guidelines were set during the basin-wide plan to agree upon consistent methodologies and framework which were used to implement local

plans; each entity reported on these plans annually. Discussions of one NRDs effect on another have occurred during basin-wide meetings.

Could mitigation efforts upstream alleviate mitigations efforts downstream?
There can be benefits to holding water upstream as long as possible, allowing it to trickle downstream; if this can be enhanced, the basin may want to consider this action. It is too soon to know what specific mitigation efforts may be needed. Mitigation will not occur, unless it has a positive impact on water users.

Can an unmet downstream demand cause an upstream basin to become fully appropriated?
This could lead to a designation in some circumstances; however, this could be worked out in planning. Downstream demands are not appropriations; they are in the evaluation to help breakdown a basin into sub-basins and provide for inflow demands.

Does the local NRD have to address issues related to new depletions in the river caused by their NRD?
Not necessarily. They would only have to address new uses that could harm an existing user; new uses could be regulated differently or water banks could be initiated to allow mitigation on a larger NRD scale. This would be a local decision.

Statute referenced in section 4.2.4.3 in the methodology does not restrict to flows or current uses at time of appropriation; instead, it refers to the current beneficial uses at time of appropriation.
The DNR's interpretation of that statute is to look at the levels of development that were in place at the time of appropriation; this has not changed significantly from the previous rules, aside from the recognition of ground water development.

The methodology does not indicate a priority system. The majority of the senior water rights in the Platte River system are above Lewellen. Will consideration be given to the priority system and preference system in the future?
The only determination these rules potentially impact is a fully appropriated determination and, in this instance, identifying the difference between over appropriated and fully appropriated. The rules are not administrative rules that will dictate how the river is administered; instead, the rules will provide information on where the water is used, how it is consumed, and the current water balance.

If surface water rights are established, will the permitted amount be used for consumption?
No. The best available data will be used. Measurable data on water diversion is available for some surface water rights, while other surface water rights have only data on appropriated acres available. Field office staff and other data sources will be consulted to determine what percent of overall water rights are irrigated to proportion down. Crop distribution at the county level will also be utilized.

QUESTIONS RELATED TO RULES SECTIONS

Can a designation be made at the sub-basin level?
Designations could be made based on sub-basins (for example South Loup, Middle Loup. Designations can be as refined as the data and tools will support. The evaluations will also define downstream demands, allowing for NRDs to incorporate downstream demands into their IMPs if they choose.

Will this methodology be applied to all basins in the state?
The DNR will have to look at the specific data from each basin to determine if the evaluation is appropriate or applicable based on the tools and data available.

What will be the DNR's response to those who question the omission of recreational and environmental uses of water? Does this fall in state water law?
The demands being considered are discussed in 001.01 D. If recreational water uses becomes an issue, it can be brought forth to the DNR to determine if the water usages warrants consideration in the evaluation.

Are districts going to be evaluated individually?
Evaluation will be done at the sub-basin level, not necessarily based on district lines.

Will separate reports be produced for each basin?
Yes; it will be more refined, with each sub-basin being evaluated. Instream flows and downstream demands will be taken into account for each sub-basin evaluation and designation; downstream demands are proportioned throughout the entire basin system.

Would it be possible for a schedule to be developed to identify when each sub-basin will be announced?
Part of the motivation to finalize rules this year is the Lower Platte Basin will be reevaluated; the Niobrara is also under 483 restrictions and has 1-2 more years under the discretion of the director of the DNR. Otherwise all areas not currently fully appropriated will be evaluated. The Department may have to limit the extent of these evaluations due to limitations on data and tools in certain areas.

If the summation of the excess exceeds the summation of the shortages, does that mean the water basin will not be designated as fully appropriated?
Yes. The DNR recognizes there will still be shortages; however, the basin could be perfectly balanced in the long term with better management.

There is one measuring point on the Big Blue; if the Big Blue comes close to being fully appropriated, how would the process distinguish between the water needs of the Upper Big Blue and Lower Big Blue?
If the data is available, the evaluation could be completed at any scale. The current rules begin at the basin-wide scale for the Big Blue. If the Big Blue is found to be fully appropriated, an assessment could be done to determine where the water supply originates and is being used within the basin.

What is the timeframe between the determination of the methods and the release of the results?
This will be made available once the report is published. The underlining model documentation will be in the report. If a preliminary determination is made, there is a 120 day period between the preliminary determination and the final determination. Going forward, the DNR would like to provide information on the methods before the evaluation is released.

Will a determination be made on each sub-basin and then the larger basin?
Determinations will be done on each individual sub-basin. Larger basin summaries may be available on the web portal; the summary may also be aggregated to a larger basin summary.

Will a model or formula be developed to assist in determining a designation?
Both models and formulas will be developed. Groundwater models will help calculate groundwater depletions; soil-water balance models will assist in the calculation of surface water and groundwater consumption; stream flow data will assist with instream flow demands, hydropower demands, and diversion data. All of these elements will be described in the methodology; the specific model used will be documented and peer reviewed. The Nebraska Supreme Court required the evaluation process to be replicable; in accordance, the methodology will be written in a way that is transparent and replicable.

The rules say all districts within the 10/50 area in the basin would be designated?
Yes. Some basins may fall in just one district; some may lie in multiple districts.

The rules do not reference the methodology or the HDR report. Is the intent to use the consultants' recommendations as presented or will they be modified?
Some modifications to the HDR recommendations have already been made. For example, the HDR recommendations for hydropower and instream flows were modified.

The rules do not specifically reference the methods or the HDR report. Is there a tie between the rules and the methods or HDR report?
No, there is not a current direct linkage between the rules and the methodology due to the desire to retain the flexibility of the rules. The DNR intends to make the methodology available for review and replication. Input on the methods is welcome. The final methods will contain applicable references to the final rules.

Title 457 is the rule. The methodology states where the statute governs and where Title 457 applies. This is the overall link.
Yes, that is how the DNR views this.

Would a designation be made for the entire basin or would a sub-basin be separated out?
Basins will be separated out into sub-basins to make a designation. It is possible the entire basin will still be designated as fully appropriated, but the decision will be made at the sub-basin level.

Do the NRDs have the ability to evaluate at a finer level than just sub-basins?
Yes, if the data is available and appropriate. The choice to look at sub-basins was to balance annual workload and availability of data and models.

The presentation discussed differentiating between fully appropriated and over appropriated; however, the rules do not define the methodology used to analyze the difference between a fully appropriated basin and over appropriated basin. Why wasn't a section specifically dealing with over appropriation and fully appropriated incorporated into the rules?
The methodology used to analyze the difference between over appropriation and full-appropriation is located in the statutes and thus was not duplicated in the rules. The statutes dictate that a fully appropriated/over appropriated analysis must occur in a manner consistent with the rules. The current rules do not align well with the planning process in the over appropriated basin; the current rules seeks to determine the current water supplies and uses to better direct the planning process. The statutes already dictate that the rules must be used during an analysis; rendering a duplication of information unnecessary.

You are not seeking comment on the methodologies, even though some of the methodology was incorporated into the presentation?
The methodologies were provided to give people better context of how the rules will be applied. Comments on the methods are not necessary at this time.

The rules provide little information as to what actions will be taken during the evaluation. Is the methodology part of the rule and, if not, can the methodology be changed without going through the same extensive process necessary to change the rules?
No. The methods are not part of the rules. The overarching concepts of the rules look at water supplies and water uses during two annual seasons over a representative period to determine water balances. Specific methodologies are not discussed in the rules due to a few reasons: existing data and tools throughout the state are not consistent, the methods do not need to be promulgated, and the methods must be more flexible than the rules.

At what point is a fully appropriated designation made?
A water supply surplus or deficit is determined for each year in the representative period; the surpluses and deficits for the entire representative period are summed to determine if the basin is fully appropriated or not. This evaluation will continue to roll forward over the representative period.

Ultimately, the NRD does not have to agree to an IMP; if they do not, it would go to the Interrelated Water Review Board appointed by the Governor to make the final decision.
Yes. That is the process; however, this process has not been necessary in the past.

If an NRD allows a new water use in a fully appropriated or over appropriated basin, are they required to offset the effects of the new uses within their NRD?
The NRD would need to deal with the effects of new water uses; however, they would not necessarily have to offset these uses. There are processes to manage new uses through a regulatory process or projects developed that create water banks and allow new water uses to happen.

What happens following a fully appropriated designation? Will fines be instituted for drilling more wells?
Stays would go into place to limit or preclude development of new wells and surface water rights. The IMP could allow for some new development. The main motivation is to protect existing water uses and determine what new water uses can be supported given the current water supply.

What is the timeframe between the determination of the methods and the release of the results?
This will be made available once the report is published. The underlining model documentation will be in the report. If a preliminary determination is made, there is a 120 day period between the preliminary determination and the final determination. Going forward, the DNR would like to provide information on the methods before the evaluation is released.

Will the December 2013 evaluation be a preliminary determination?
Yes. The report is always a preliminary determination.

Will the evaluation always be in December?
The evaluation will likely always be in the last quarter of the year, typically in December; however, this will be at the discretion of the DNR director.

Once a basin is determined to be fully appropriated, will information be made available defining the extent of the water deficit?
Yes, the summation of the water surpluses and water deficits will be calculated to determine exactly how great the overall water surplus or deficit over the representative period is. This evaluation will not lead to an over appropriated designation; instead, it will set a line of balance moving forward.

Theoretically, a basin could shift between being determined as fully appropriated one year and not fully appropriated the next year?
This situation is possible, but unlikely. Since the intent of the statistics is to capture wet and dry cycles, as the representative period moves forward, it is likely the wet and dry cycles will remained balanced in the representative period and will not cause

the water supply balance to fluctuate drastically within a basin. The statistics will be reevaluated yearly to ensure the representative period is appropriate.

When will access to the report be granted?
This year, might be different than future years due to time restrictions. Information will be made available as it is being developed. Going forward, a process may be developed to disseminate information on the methods earlier.

The incorporation of downstream demands gives upstream NRDs a perceived standing in the management plans of downstream NRDs as their water use can potentially affect the upstream NRDs water appropriations. Do upstream NRDs need to adjust their IMP in accordance to downstream NRDs water supply?
This is exactly why there was a basin-wide plan; all those provisions were outlined in this basin-wide plan. General guidelines were set during the basin-wide plan to agree upon consistent methodologies and framework which were used to implement local plans; each entity reported on these plans annually. Discussions of one NRDs effect on another have occurred during basin-wide meetings.

Should upstream NRDs have some say in the planning process of downstream NRDs since downstream management decisions to reach fully appropriated designation or keep them under fully appropriated might have an impact on the upstream NRD in a time-delayed fashion? I contend yes. If so, can they help us get into that process?
A basin-wide plan in the Lower Platte is being developed through a coalition of the seven NRDs; the first action of the DNR was to invite all NRD's in the Platte Basin to participate in this planning coalition. The North Platte NRD chose not to participate; they continue to have an open invitation to join the coalition.

Can perfect management be explained? It does not seem possible for surpluses in one year to cover deficits in another year. Additionally, how will surpluses be captured to carry through to deficits years or decades later? How is perfect management achieved?
Conjunctive management and retiming the excess flows back into the system are two examples of current actions aimed to reduce shortages and take advantages of surpluses. The conjunctive management strategy is currently being used in the Central Platte NRD and is being considered in the Republican Basin.

Will groundwater and surface water consumptive uses below Lake McConaughy be charged to stream flow water supply in the North Platte River? This question is specifically geared toward Rule 001.01 C, which indicated the DNR will assign a portion of the basin-wide water supply necessary to meet downstream demands. How much of the basin-wide water supply below Lewellen, Nebraska will be charged to the North Platte NRD?
Rule 001.01 C assumes that all the water upstream of Lewellen, for example, cannot all be consumed as users downstream rely on some of that water. Downstream demands are set into the rules for the purposes of planning. Basin NRDs will

determine how downstream demand is accounted for during the technical analysis in collaboration with the DNR. A specific answer to the question is unknown at this time; however, there would be recognition of the fact that not all the water supply above Lewellen could be consumed as there is some downstream dependency on the water.

The methodology points out that the North Platte NRD has a vested interest in monitoring and participating in the planning processes of downstream NRDs.
Downstream users are not perceived to have a significant impact on upstream basins. These conversations would be beneficial during the basin-wide meetings and planning efforts.

Could mitigation efforts upstream alleviate mitigations efforts downstream?
There can be benefits to holding water upstream as long as possible, allowing it to trickle downstream; if this can be enhanced, the basin may want to consider this action. It is too soon to know what specific mitigation efforts may be needed. Mitigation will not occur, unless it has a positive impact on water users.

It appears as though the planning process and the evaluation process are being blended.
The rules state how water supply and water use are going to be monitored going forward. It is the approach that is going to be used. Refinements can, and will, continue. Much of the state currently does not have this type information formatted in such a usable way.

The methods discuss the impact an IMP – or the process of developing an IMP – can have on a basin being designated as fully appropriated. Can you expand upon this?
Rule 001.02 B-C determines if a current IMP or the initiation of a new IMP can accomplish the same outcome as a designation. This determines if an IMP can protect existing users similar to a designation. The statutes are being looked at comprehensively to make preliminary determinations.

If work on an IMP is currently in process, is an evaluation still completed on the basin?
Yes, a preliminary determination will be made. If an IMP has been initiated and a management area for hydrologically connected water is established, the NRD would have three (3) years to finalize their IMP to prevent a designation from being made. LB483 requirements would be initiated once the preliminary designation was made. It would then be at the Director's discretion as to whether an evaluation is made during that four (4) year period.

The Lower Platte North NRD is currently working on their IMP and would like to time the release of their IMP to be in accordance with the new rules.
The rules would allow for NRDs to begin working on IMPs immediately. If the IMP process is currently underway, a final determination would not have to be made in the

instance of a preliminary fully appropriated determination. Starting the IMP process now would allow an NRD to remain ahead of the curve.

Once a basin is declared fully appropriated and the IMP process is begun, it is not possible to terminate the IMP process if a basin is then found to not be fully appropriated.
In areas that have not been designated, there is a mechanism for reevaluation. If the NRD chooses to terminate the IMP, they can request a reevaluation; if the reevaluation determines the basin to not be fully appropriated, the IMP process can be terminated.

Gaps between the impacts LB962 were intended to address the point at which NRDs can terminate the planning process to address impacts if they are no longer designated as fully appropriated or over appropriated.
The evaluation is a technical analysis; the results will not necessarily determine the next increment, it is an incremental approach. The basin group (POAC) will decide and implement the goals for the next increment. That data cannot be strictly interpreted; socio-economic factors and environmental factors must also be taken into account to set appropriate goals and objectives.

How are demands in hydrologically connected areas, as defined in Rule 001.01 C, going to be evaluated?
The determination of 10/50 areas has not changed and is not intended to change. For hydrologically connected areas, the groundwater consumption in that area would be analyzed. Hydrologically areas in the rules always refer to 10/50 areas.

Use of the 10/50 area in the methodology is unclear; is the 10/50 area only used for determining the groundwater demand or is it also the limit for adjusting the supply?
Depletions are calculated from where they occur not exclusive of the 10/50 area; consumption is the only demand considered for the 10/50 area. Generally, 10/50 areas are used primarily for irrigation consumption.

Does the new methodology threaten to change hydrologically connected (10/50) areas or will these areas remain the same?
The rule (001.03) is not being changed; if the data and rules remain constant, the results will be unchanged as well. Using data gathered from a recent evaluation of eastern Nebraska, the DNR intends to develop ground water models; in conjunction, some hydrologically connected areas may be modified.

QUESTIONS RELATED TO METHODOLOGY

Who paid for the HDR study?
It was funded through an IWMPPF Grant; the Central Platte NRD, Twin Platte NRD, and representatives from the other basin NRDs (Tri-Basin NRD, South Platte NRD, and North Platte NRD) were the applicants on the grant.

Has the DNR consulted with climatologists at the University of Nebraska-Lincoln to project future reductions in Platte River flows or increased evaporation rates across the state?
Climate change was not incorporated; the water supply will continue to be tracked over time. The process will recognize long term changes through the representative period.

Was this methodology used in the 2012 evaluation?
No. This process began by working with NRDs in 2009; an outside consulting group was hired and provided the DNR with recommendations which were initially conceptualized through evaluations of the Upper Niobrara before being expanded to the Lower Platte Basin and eventually the entire Platte Basin. The intent is for the methodology to be applied during the 2013 evaluation.

Was the formula/model arrived at jointly though HDR and the DNR?
The methodology was developed through recommendations from HDR, stakeholder meetings, the NRD study, and DNR assistance.

The rules do not reference the methodology or the HDR report. Is the intent to use the consultant's recommendations as presented or will they be modified?
Some modifications to the HDR recommendations have already been made. For example, the HDR recommendations for hydropower and instream flows were modified.

In determining the available water supply, will the method developed by HDR be utilized?
Generally, the DNR intends to use the same concept, but may modify it.

Will this model (Blue Basin Model) be used in the annual evaluation?
The current intention is to use this model during the evaluation.

Will peer reviews be made to determine what uses can occur and ensure the review is balanced?
The director of the DNR is committed to ensuring the science behind the evaluation is accurate. Peer review by outside consultants can occur during the 120 day period between the preliminary determination and the final determination; this process was used to overturn a determination in 2009. In the future, the DNR hopes to make the methods available earlier in the year; the DNR typically consults with the local NRDs to gather data, information, or models to support the current analysis; irrigation districts and other water managing entities may also be consulted in the future.

Where is recharge calculated into this evaluation?
Recharge and precipitation are elements of this evaluation and are incorporated in the groundwater models through the analysis and are parsed out with available tools in the analysis.

How is a reservoir parsed out, in terms of a basin supply? If a reservoir is designated for an irrigation or non-irrigation use, is that accounted for?
Reservoir storage is addressed by parsing it to demands consistent with its use; an additional demand for only storing the water is not accounted for. Most reservoir water in Nebraska is used for irrigation; to balance the water supply, water demand is allocated for the non-irrigation season and the irrigation season.

If basin water uses are greater than total water supplies, the mitigated effect cannot come from additional basin water supplies (water supplies cannot be increased to mitigate increased water uses)?
For the technical analysis, there is water supply and water use. Water in the non-irrigation season could be looked at to mitigate water use in the irrigation season, if retiming can accomplish this. This has been done through the planning process.

Do the percentages ignore the fact that tributaries have different supply needs on different days?
This will allow for more sub-basin understandings of the water uses and supplies and how they affect downstream uses. Many aspects still need to be considered. As more data is gathered, the process can change and adapt to fit the evolving information.

Is stream flow return (municipal) actively built into the system?
Yes; however, each city is unique. Omaha, for example, pumps from a different river than they return to. A net pumping calculation is determined by determining how much water was pumped and how much water was returned in that same basin.

How are comingled acres calculated?
The specifics of calculating comingled acres would be determined in cooperation with the local NRDs during the evaluation. In other areas in the state, comingled acres are less prevalent; however, this will be something that will continually be investigated. Comingled uses would either be categorized as a groundwater use or a surface water use.

How do the proposed rules treat storage water supplies held in Wyoming for the use of the North Platte project?
The current rules do not address these water supplies. The objective of the new rules is to provide information that is useful for planning and setting goals and objectives for the next incremental period. This requires the DNR to take into account historical inflows at the state line; this information will not be used to change how inflows come into the state or for regulation on inflows.

How does this concept build in lag effects of groundwater users that do not appear as stream flows?
The temporal aspect has been removed from the current rules; instead, ground water consumption is considered. As a result, conceptually all lagged effects are included.

Will groundwater demands be an estimated number?
This will depend. The best available information (e.g. certified acres or metered data) will be used. If this data is unavailable, a similar data set to estimate groundwater pumping will be created by coupling land use data with soil use models with a soil-water balance. If only partial data is available, the available data will be used to help calibrate estimates and ensure accuracy.

Can hydrologically connected areas change overtime with variations in groundwater levels?
It will not change substantially over time with variations in groundwater levels. The groundwater model is impacted greatest by the proximity of a well adjacent to a live stream and the geological properties of the aquifer; these properties do not generally fluctuate. Refinement of the tools would be more typical; numerical models and statewide coverage are being developed. Under this process, the 10/50 area could potentially change.

Hydrologically connected areas are streams that are fed by groundwater. The rules indicated that the USGS Perennial Stream Map would be used to identify hydrologically connected areas. Within the Blue Basin, there is a considerable area that is not hydrologically connected.
In this area a ground water model is being developed; the groundwater model will be used to calculate a 10/50 area. HDR is developing this.

Will groundwater consumption only be done for wells in 10/50 areas?
Correct, groundwater consumption will only be analyzed in hydrologically connected areas. The rule defining hydrologically connected areas did not change between the previous rules and the new rules and will continue to be used going forward. On a whole, most groundwater consumption in Nebraska falls within a 10/50 area; very little groundwater consumption occurs outside of a hydrologically connected area.

The statutes include recharge of the aquifer through the system as a provision of the water supply. How is this considered and does a consumption amount for ground water recharge need to be included?
Ground water recharge is considered in both the total water uses and total water supply. All data and methods used in the evaluation will be made available. Sub-basin summaries will allow for the access of data and high level summaries.

On average, how much water is pumped for any given well in one year?
Generally, a pivot in the eastern portion of the state runs on an average of 90-100 acres. The current evaluation incorporated corn-crop irrigation requirements, which ranges from 15 inches in the west to 4-5 inches in the far southeast.

If water uses are greater than the water supply, then you are fully appropriated. When the evaluation is run, anything that is a new use would be over the basin water supply?

A few distinctions exist between water supply and water uses. The water supply balance is determined by looking at the stream flow and water depletions. Surface water consumption is part of the water supply and total water use; creating an offsetting effect. Stream flow is a large piece of this analysis and can balance out other factors; thus a new use may not necessarily result in a fully appropriated designation.

Are municipal induced recharge permits considered in calculating demand?
DNR would be looking at water consumption under these permits instead of water flow.

If basin water uses are greater than total water supplies, the mitigated effect cannot come from additional basin water supplies (water supplies cannot be increased to mitigate increased water uses)?
For the technical analysis, there is water supply and water use. Water in the non-irrigation season could be looked at to mitigate water use in the irrigation season, if retiming can accomplish this.

According to the draft rules, a pivot depletes the river one-tenth of what is run.
This is an average, a pivot could deplete more or less than ten percent of what they run; depletion is relative to the wells proximity to the stream, and properties of the aquifer.

Has consideration been made to which gauges would be used in the evaluation for the over appropriated basin?
The DNR has not identified which gauges would be utilized. The evaluations would be done in conjunction with the NRDs and the Platte Over appropriation Committee. A meeting of the Platte Over appropriation Committee will be held on June 3, 2013 to discuss the steps necessary to begin this analysis.

Will available water leaving state lines be computed into the methodology for the Lower Platte Basin analysis?
Yes; this will be factored into the proportion of downstream water demand.

How will reservoirs be incorporated into this evaluation?
Most reservoirs were developed to supplement irrigation needs. When taken into consideration, storage demands are parsed into the non-irrigation season and the irrigation season. More complex reservoirs – such as Lake McConaughy – represent the need for the methods to be more flexible.

What tools will be used to measure water usage along the Missouri River?
Complex geology in the eastern portion of the state – including glacier deposits – creates additional challenges in this area. A recent evaluation of the geology of the eastern portions of the state was undertaken to determine the best way to assess ground water depletions. This report recommended using analytical models currently in use and developing numerical groundwater models; development on these models

will begin in the coming months. The current methodology would not be used where data and tools are unavailable; areas of the Missouri tributaries may be part of these areas.

Can an example of how demand is calculated be given?
Considerations for supply will be based on: stream flow, ground water depletions, and surface water consumption; water uses (demands) will be based on: groundwater consumption, surface water consumption, instream flow demands, hydropower demands, water to convey surface water uses, and downstream water demands. Some return flows will show up on the gauges, some will not.

Is the adjustment based on the lag effects of the wells up to 2013 or does it go beyond 2013?
The DNR will look at the full level of consumption from wells, not the lag impact as it is currently done. All groundwater and surface water development prior to an instream flow appropriation will be analyzed; the hydrology will then been analyzed as it moves forward and is available under the appropriation.

What is currently being done or will be done to deal with induced municipal well appropriations?
There are only a few of these in that state – mainly Lincoln and Omaha. These are coincident with the instream flows. Consumption will be designated as groundwater consumption. Consumptive use estimates will depend on the municipality as Lincoln and Omaha differ significantly.

Are the two gauges identified for the Big Blue on the map the two gauges used?
Yes, that is correct. The methodology allows this to be refined as long as it is supported by the data and the tools. These gauges would be used in the initial evaluation; however, other gauges could be used per the agreements in an IMP.

How do the methods calculate instream flows?
A general example is in the methods. Statutes require the DNR to look at instream flow appropriations and the levels of surface water and ground water development in place at the time of appropriation

The North Platte NRD is required by statute to have meters on their irrigation wells; most areas below Lewellen on the Platte have neither meters nor allocations. For the purpose of applying the methodology, will the department require measured groundwater pumping or will it rely on estimated groundwater pumping?
The best available information will be relied upon. If measured data is available, that will be utilized; if measured data is unavailable, estimated pumping would be used. Many NRDs in the Lower Platte Basin began requiring metering on new uses in 2009. These metered areas can be used to calibrate estimated pumping.

Will groundwater demands be an estimated number?
This will depend. The best available information (e.g. certified acres or metered data) will be used. If this data is unavailable, a similar data set to estimate groundwater pumping will be created by coupling land use data with soil use models with a soil-water balance. If only partial data is available, the available data will be used to help calibrate estimates and ensure accuracy.

How will groundwater data be gathered in NRDs without groundwater meters?
If NRDs have metering data, this information will be used; a process to estimate water use will be developed for NRDs that do not have metering data. This process will use a hierarchy of information to create a land use layer to develop groundwater irrigation acres, including: surface water acres, aerial imagery, remote sensing to estimate acres, calibrating soil-water estimates with the overall groundwater.

Amount of water pumped does not typically equate to the amount of water consumed.
The evaluation takes this into account by looking at pumping and efficiency.

Without metering data, will the DNR be able to capture future groundwater consumption?
The current method captures the full consumption of groundwater use in the 10/50 area. The full consumption of surface water and groundwater will be assessed to determine the total consumption of hydrologically connected areas as water uses in hydrologically connected areas will eventually have to use the basin water supply to balance out. The DNR is confident in the data; the models have been tested and the hierarchy of the data has been tested and synthesized. Certain areas will still rely on models; however, improved models or data will be incorporated into the evaluation process as they come available.

Will groundwater consumption only be done for wells in 10/50 areas?
Correct, groundwater consumption will only be analyzed in hydrologically connected areas. The rule defining hydrologically connected areas did not change between the previous rules and the new rules and will continue to be used going forward. On average, most groundwater consumption in Nebraska falls within a 10/50 area; very little groundwater consumption occurs outside of a hydrologically connected area.

What databases are going to be used to determine current and future groundwater consumption?
Presently, certified acres coupled with the soil-water balance model. The soil-water balance model aids in the determination of net irrigation requirements for a specific crop. Crop types and acres are analyzed to determine consumptive requirements for the acres to determine the total consumption. Land use depends on a hierarchy of best available information. The best available information will always be used and will be determined by what information is available.

If surface water rights are established, will the permitted amount be used for consumption?
No. The best available data will be used. Measurable data on water diversion is available for some surface water rights, while other surface water rights have only data on appropriated acres available. Field office staff and other data sources will be consulted to determine what percent of overall water rights are irrigated to proportion down. Crop distribution at the county level will be also be utilized.

The DNR has done the calculation to determine the water use balance for surface water users. The new rules leave this obligation to each individual water user to figure out how often the water might be available.
The DNR could continue to do this; however, water balance is not always predictable. Determinations of junior water rights are at the discretion of the prior appropriations system. The issue with predetermining the water supply for junior water rights is the water supply for the next year is always an unknown.

Are there any instances where the Omaha and Lincoln municipality's induced recharge appropriations exceed the instream flow appropriations? Could this happen if adjustments were made?
No. There are no instances where this currently happens. Induced recharge permits are generally around 500-700 CFS and instream flow permits at Louisville are generally around 3,700 CFS.

What is an example of downstream demand?
As an example, the Loup Basin would need to consider instream flow demands in the Lower Platte.

What hydropower demands are figured into the total water uses?
Specific examples of this can be found on page 13 in the draft methods. Historical diversion records are consulted for each facility, taking into account how much water was diverted and on what date. To determine the demand for each day, the total amount of groundwater depletion for a given day was added to the total water diverted to calculate total water demand for that day.

The methodology outlines a three-step process for instream flow demands and a two-step process for hydropower demands. An example given for estimating instream flow demands begins with 1,800 cubic feet per second and ends with 1,500 cubic feet per second once the process is complete. Can this process be explained?
The statutes define criteria for fully appropriated determinations with instream flows defined separately. The statute requires the DNR assess the available water at the time of designation; the DNR interprets this statute by looking at the development - surface water development, ground water development, and the remaining supply available - that was in place at the time of designation. For example, consumptive levels prior to 1993 will be included when evaluating development for Lower Platte instream flow appropriations.

Assigning ground water demands do not make sense as ground water depletions do not occur upstream. Why is this apportioned upstream?
Surface water and ground water are hydrologically connected. This is just recognition that hydrologically connected waters – both surface water and ground water – have some need for stream flow to balance water supply based on a historical consumption.

Will the DNR be including only one wet and dry cycle or will multiple cycles be included?
The DNR will use the most recent data available and work retrospectively to determine the most appropriate date range to capture full cycles that it feels represents the long-term water supply.

How are downstream demands being calculated per section 4.3.2.6 in the methodology?
Examples of these calculations can be found in the HDR report. Another example is as follows: if there are 100 units of demand at the far eastern portion of the Platte River Basin, the Central Platte contributes 20 units, the Loup contributes 20 units, and the Elkhorn Basin contributes 40 units; upstream proportioning would be given accordingly. Downstream demands are proportioned based off the upstream water supply origination.

How is the representative period determined?
Two statistical tests are used to determine cycles in the data: autocorrelation and Kendall Tau. These statistical tests will allow the DNR to identify cyclical wet and dry season trends and determine the appropriateness of the date range of the representative period. These tests were done for the Platte basin with the representative period ranging from 1985-2010.

Will the representative period remain stagnant at 1985?
No. The representative period will continue to move forward as the evaluation progresses. The data will be lagged one year from the publication date to ensure accuracy and completion.

As a representative period moves forward, is it possible for a water basin to undergo an appropriation designation shift? Can a basin be determined fully appropriated one year and not fully appropriated the next, and vice versa?
A designation would be granted based off the sum of all deficits and the sum of all surpluses. If the sum becomes negative, a basin would be designated as fully appropriated. A one year shortage will not cause a basin to become fully appropriated if other years are well balanced. A dry trend over many years could cause a basin to become fully appropriated. Similarly, the representative period could oscillate. This analysis cannot lead to an over appropriation designation.

Will the representative period be a moving timeline?
Yes, a moving representative period will be used.

Could the representative period be different across different basins?
Yes. Some basins may be more or less consistent than others creating different representative periods.

Who makes the decision on length of the representative periods?
Statistical analysis will be used to determine trends in the statistic and determine the length of the representative period. Autocorrelation will identify cycles that exist in the data and will determine the most appropriate period to capture wet and dry periods.

Could a representative period be the same for a number of years in a row?
The number of years in the period may remain constant; however, the years of data that are utilized would change in future years.

A 25 year projected determination is discussed in the methodology, can you elaborate on that?
A statutory requirement dictates that current and future levels of development must be assessed when making the evaluation. Designations are not made based on future levels of development; instead, projected levels of future development are intended to provide possible future scenarios.

The details beyond the calculation of water supply and water demand during the representative period are left to the judgment of the DNR and their consultants.
The DNR will be looking at the best available information and tools. Entities that may be impacted by the evaluation will be consulted to determine if more appropriate or accurate data or tools are available. Annual emails are sent to NRD managers to inquire about surveys or data that should be conducted or collected; this email could be disseminated on a larger scale, if desired.

For the Loup Basin, what period of time will be used for the representative period?
The representative period for the Loup Basin has yet to be determined. To determine this, a trend analysis and autocorrelation test will be run to determine the most appropriate period. Typically, the representative period in Nebraska is 20-30 years.

The rules suggest that over a period of time a summation of the excesses and shortages is assessed. What period is used to measure change relative to the granting of water rights?
This example is specific to instream flow; in statute, instream flow permits are different in that instream flow appropriations are analyzed at the time of approval (all development in place must be recognized to determine their effects on instream flow appropriations). The HDR report recommended comparing the recent period and the prior period; this was modified in the draft rules so that changes in hydrology would be included.

Will the representative period be modified annually?
Yes, the representative period will be reanalyzed every year. If the representative period is determined to be unchanged, the period will move forward one year. This will not be 25 years in all cases; the statistics will be annually reevaluated to determine the representative period.

Regardless of the length of the representative period, will the period be incremented forward one year at a time?
Yes, that is correct.

Does the representative period move and how many years will be taken into account?
Yes, the representative period will progress each year. The number of years in the representative period will be determined using statistical analysis. It is likely the different basins will have different representative periods; however, it is likely the representative period will be between 20-30 years.

What statistical analysis tests will be used to determine the representative period?
Two measures will be used: the Kendall Tau approach and autocorrelation tests. These tests are identified in the methods. Other indicators could be considered in the future.

Is the period of record for stream flow in basin water supplies only the representative period or will all available information be utilized in the assessment?
The DNR will be looking at the most recent portion of flow records that is representative of natural hydrological cycles. Statistical analysis will be used to evaluate trends and identify wet and dry cycles to indicate the best representative period to use.

Why would the DNR not want to maximize the data used in the evaluation to capture the best trend lines?
The data will be used in adaptive management process moving forward. Water usage changes overtime and water usage data from the mid-twentieth century may not be relevant today. The representative period is long enough that it represents cycles; however, it is short enough that it can recognize future changes. More recent information is likely better able to capture future projections of water supply and water uses.

Is any information available on the website detailing how the representative period is determined?
The details can be found in the methods or the HDR report. The HDR report can be found on the annotated timeline available on the DNR's website.

The representative period will always use the most recent data but the length of the representative period could change and could be different among different basins?
Yes. The statistical analysis may determine the representative period for one basin is 15 years and the representative period for another basin is 20 years. It is unlikely the representative period will be change drastically from year to year.

Are crop reduction inputs still being utilized?
No; however, Derrel Martin at the University of Nebraska–Lincoln created the CROPSIM model – a soil-water balance model technical tool – to analyze precipitation and how it is parsed at the field level. This tool is used in every groundwater model across the state that has been developed by the DNR. This tool is used to estimate pumping and recharge and runoff values.

For those who do not have certified acres established, what will be used for the acres?
A hierarchy of data will be used. Certified irrigation acres are considered the best available data source; in instances where this information is unavailable, the 2005 CALMIT layer, which identified irrigated and non-irrigated classes, was consulted along with aerial photos, digitizing of wells, and Census data to determine the percentage of irrigated lands each year. The GIS Workshop has assisted in these estimates and information gathering.

How is municipal growth calculated into the analysis?
Some of this information is incorporated into the analysis; Omaha has a water permit through 2032 projecting their growth. The DNR has typically included these projections contained within their permit in the analysis.

How are reservoirs dealt with in the methodology?
The demand for surface water use is parsed between the irrigation season and non-irrigation season. Evaporative losses would be allocated to the season in which they occur.

Under the methodology, will it ever be possible for the North Platte NRD to achieve fully appropriated status instead of over appropriated status without having to retire existing water uses?
There will likely always be some planning process required in this NRD moving forward. The only thing that would change if a not fully appropriated designation were reached is the planning process would halt; likely an undesirable outcome to all stakeholders. The technical analysis will be consulted in conjunction with the planning process to determine what actions are necessary.

Under the methodology, would it ever be possible for the North Platte NRD to have the fully appropriated designation removed, assuming there is no change in the law?

The designation on the North Platte NRD was statutory and is unlikely to be reversed; the only way this can be reversed is if the legislature overturns their designation or drafts a new law. Over $40 million has been made available to the Platte coalition and other groups for projects; unfortunately, no significant projects have come from the North Platte NRD area yet.

Why can't the current methodology be used for downstream analysis?
The current methodology does not have a component for downstream analysis. The current methods look at junior water rights in the system; if junior water appropriators have at least 65% of their water needs during July and August and 85% of their overall irrigation needs, there is no need to designate. This is based on the number of closures the DNR administers on the surface water system. This methodology could be applied; however, it does not lend well to the planning process outlined in the current IMPs.

How will the environmental account appropriation be incorporated into the evaluation?
Very specific details of the methods for the over appropriated portion of the Platte still need to be developed or revisited.

Could the current methods be used for a few more years until the direct impact of downstream demands to upstream NRDs is fully understood?
An evaluation will be done at the end of this year. If the rules are not passed, the old rules and methods will be used. Other entities in the state are affected by the rules and are planning for the rules change. The goal of these rules is to protect existing water uses and proactively manage water balances.

The methods seem to encapsulate that models are inconsistent throughout the state; different tools could be selected to apply the methods. The Supreme Court ruled that the rules were required to be written in such a way that different parties could reach the same conclusions using the same data. If the methodology is not provided, the rules lack necessary details to accommodate the requirements of the Supreme Court.
Those are legal matters; the DNR has consulted with their attorney to determine the appropriate balance between the details in the rule and the flexibility of the rules to accommodate the information in the methods.

How will existing interstate agreements/requirements be incorporated into the evaluation?
DNR statutes require all interstate agreements to be honored. Of areas that are not fully appropriated, only one interstate agreement exists on the Blue Basin. This is a delivery compact on the state line; when water delivery is interrupted, all water rights junior to the Compact are closed. This could have an impact on existing users and would likely be recognized in the methodology.

Are the main factors to determine the appropriation in the Blue Basin meeting the Kansas Compact requirements and meeting the surface water diversion demands?
In this instance, surface water consumption technically has no effect as surface water is accounted for in the total water supply and total water usage. Downstream water demands over the representative period will have an effect on this evaluation for those periods when targets are not met.

MISCELLANEOUS QUESTIONS

How many acres of water leave the state lines at Plattsmouth, Nebraska?
Between 5-7 million acre feet leave Nebraska at Plattsmouth. The actual basin water supply is likely more like 10-15 million acre feet.

What is the current progress on the CENEB model?
The model should be complete in the next month; documentation for the model may not be complete at the same time, however.

Is the map of subbasins used in the analysis on the website?
The full presentation will be published on the website and can the map can be found on page 8 in the methods.

An evaluation survey was previously disseminated; is this survey related to this process or is it coincidental that the survey is being disseminated at these public Q&A meetings?
This is coincidental and the DNR is taking advantage of the opportunity to disseminate the survey. The DNR has been working with the University of Nebraska Public Policy Center for a year and a half to evaluate DNR's public participation processes. The survey does not have an impact on the rules. The survey is intended to capture the different perspectives of the stakeholders.

Participant Comments

TIMING

If possible, it would be good to lengthen the deadline for public comments beyond June 7.
Statutory restraints related to completion of the annual evaluation prior to January 1st will not allow for the timeline to be extended. The process to adopt rules takes significant time and the evaluation must be done at the end of the year. The rules were re-written in 2005 and then amended in 2006; they will hopefully be re-written again this year and can be amended in the future. Decision on specific methodologies will be determined with each NRD.

Do comments heard today convince the DNR that the June 7, 2013 deadline for comments should be extended so everyone is able to give their fully educated comment and suggestions?

There is not much flexibility to move the timeline forward; the process has been underway for the last four years and a conclusion needs to be reached before the statutory deadline. A final public hearing on the rules change process will be held in late summer, allowing for comments to be formed up until that date, if wished. Those who have objections or need more time to craft a comment will have time before the formal public hearings.

OPPORTUNITIES FOR PUBLIC INPUT

Many of the rules are derived from the statutes; why is the DNR not incorporating a section on over appropriation and full-appropriation to describe the process for using this methodology?

From the perspective of the DNR and the NRDs in the basin, it was already known that rules guided the evaluation. The DNR would be willing to consider the inclusion of an additional section on fully and over appropriation if it thought that it would provide additional clarity.

The methodology and lack of input from the NRD is a big concern as it can affect the NRD in the future. The NRD needs to be more involved in the process.

The DNR is willing to make necessary changes to disseminate information. The DNR works closely with local boards and NRDs and relies on the local partners to disseminate information into the local community.

Involvement in the process by the local NRD was not very much; the NRD attended two or three meetings in the beginning on the discussion of the rules change and attended the meeting when HDR was chosen as the consulting company. Limited discussions and cursory information on the rules changes process were held during the monthly meetings. The NRD requested inclusion into the process; however, this request was not quickly granted. Requests were made for consultants of the NRD be included in the process were not immediately responded to; requests for additional information was not forthcoming or completely received. The NRD was aware of the process; however, their involvement was limited with no involvement past the initial process.

It is unfortunate to hear this. The rules change process was a standing item on the POAC agenda for the reoccurring meetings with the intention that it could discussed as necessary or requested. The DNR intends to be transparent and does not wish to conceal any information. This concern should be addressed during the Platte Basin Meeting on June 3. The purpose of this evaluation is to assist the DNR with information sharing. This process is likely to continue; corrections can still be made to the process to ensure information and data is better disseminated between the DNR and NRDs.

Given importance and technical nature of determination, DNR should hire a neutral third party to convene an independent science panel of relevant subject matter experts to review and report on the draft rules and methods.*[1]

A summary of how the proposed rules and methods differ from the current rules and methods should be created by DNR. The summary should also address concisely why the changes are being proposed.*

It would be beneficial for the DNR to instigate an independent, third-party review of the methodologies and their application as proposed in the regulations before issuing final regulations, if one has not already been performed. A peer review would verify the robustness of the methodologies and the appropriateness of their use as proposed in the regulations and draft methodologies document.*

The draft rules leaves important criteria to the draft Methodology, which would apparently not be a rule or regulation and therefore not be subject to public notice, comment or challenge.*

CLARITY IN RULES

Rules are too vague to translate across different administrations.
The rules must be taken in conjunction with the statutes. The statutes are determined by the legislature. The statutes dictate that all goals and objectives set for the next increment must be mutually agreed upon. The rules serve as general guidelines in order to prevent a situation in which formal public hearing would be necessary to make annual modifications to the rules. The statutes contain additional specificity that the rules may lack. All elements must be considered together to determine how they function.

Clarification on 10/50 areas should be provided in the rules.
The DNR is happy to consider inclusion of additional wording or phrases to provide additional clarification in the rules.

It appears as though the planning process and the evaluation process are being blended.
The rules state how water supply and water use are going to be monitored going forward. It is the approach that is intended to be used going forward. Refinements can, and will, continue.

Questions need to be answered and work needs to be done to complete the new set of rules. I would like to applaud the DNR for considering a new set of rules; the new rules are much more understandable than the current rules are.
This is one of the main goals of the new rules. Currently, comprehensive data is not available; foundational data should be available to all people in a clear and transparent way.

[1] Asterisked remarks were received through written feedback channels and do not include a DNR response.

The new rules will provide more simplicity and clarity to water users as to how the rules will be applied when the DNR conducts evaluations to determine the appropriated status of business. Comparing a basin's total water use to supplies to determine whether a basin is fully appropriated intuitively makes sense.*

When measured by common understanding and practices, the rule is definitely vague and possibly over broad.*

The proposed rules lack details on many components required to understand how DNR will make the determination of whether a basin, subbasin, or reach is fully appropriated. Much more detail needs to be included in the rule so the rule is clear, the process is clear and determinable, decision criteria are apparent, and that application of the rule does not change year to year or basin to basin.*

The criteria and important parts of the method for determining what is fully appropriated should be clearly spelled out in the rule, and subject to public comment and the regular rulemaking process.*

Clear and thorough definitions should be included to provide clarity to the proposed rules.*

IMPACT ON BASIN WATER PLANNING

An undue burden is placed on upstream NRDs to meet the demands of downstream water users.

This rule only states that some water is anticipated to go downstream without regard to how the water will be used. It should be recognized that the technical analysis and planning are distinct. The technical analysis provides information about water supplies and water uses; the DNR will work with NRDs to determine actions taken during the planning period. Downstream demands are not appropriated; instead, they are proportioned. The technical analysis recognizes groundwater and surface water as hydrologically connected and does not distinguish between the two.

A concern of this NRD is the perceived necessity to spend increased money on consultants, lawyers, and additional time needed to evaluate every water appropriations application to determine the effect it would have on the water basin.

This concern should be brought to the Platte Coalition Group through the basin-wide planning meeting on June 3. This would be a discussion worth having with all the NRDs and the DNR.

It is the opinion of some that shutting down wells in the Loup and Elkhorn would save the water supply; however, it is the opinion of others that this is not a viable solution because this is not a rapid response action. People need to understand how this system works.

This can be achieved through coalition efforts to plan for future water needs in the Lower Platte water basins in conjunction with the voluntary IMPs. This would need to be addressed in a basin-wide context.

Adequate time must be given for any particular NRD to replicate the methods applied in implementing the proposed rule for review and analysis purposes. DNR's assurance that there would at least be a 120 day window to do so is not adequate.*

As long as groundwater and surface water are administered within Nebraska by separate governmental entities, unresolved conflicts will continue to exist between the respective water users and possibly degrade water flows.*

The proposed rule needs to clarify that no modification of the prior appropriation system, or federal storage water use contracts, may occur without the written consent of all appropriators and contractors involved or affected.*

Figure 1 in the DNR methods document portrays that fully appropriated basins will not be evaluated on an annual basis and the text describes basins that are undergoing and IMP process also will not be evaluated. All basins (or subbasins or reaches) should be evaluated on an annual (or more regular) basis regardless of current status or status of IMP.*

The rule should explicitly state that additional downstream demands will not be applied against fully appropriated or over appropriated areas.*

The result of the new rule would be no regulation of new uses, and an open invitation to dry up rivers across Nebraska.*

All wells within an NRD should be allocated the same.*

The Rule doesn't appear to address or consider the entirety of public water suppliers' water rights. The consideration is limited to the current uses as of the time of the decision, which is only reflective of part of that stream flow amount.*

By passing LB 1106 in 1984, the Nebraska Legislature gave responsibility and authority to the Nebraska Game and Parks Commission and Natural Resources Districts to obtain instream flows for fish, wildlife and recreation purposes. The new rules and methodology appear to have the potential to erode some of these instream flow rights on the central and lower Platte River (i.e., administration for the rights wouldn't occur until the flows are several hundred CFS below the actual appropriation).*

The new rule, if put in place, would effectively dry up our rivers and streams. We need a rule that requires watershed planning whenever there is any effect on instream flows and existing wells.*

A new rule should be written that would put in place watershed planning and controls as soon as new uses are having an impact on existing water rights, wells and instream flows.*

The new rule should recognize that water use in water abundant areas has the potential to damage the fragile water areas that adjoin.*

You need to reject your draft rule for determining fully appropriated river basins and write a new rule that would put in place watershed planning and controls as soon as new uses are having an impact on existing water rights, wells and instream flows*

The flexibility in the draft regulations relative to the development of voluntary integrated management plans and the determination of whether a basin is fully appropriated will continue to foster greater cooperation and collaboration in integrated management between the DNR, NRDs and local water users.*

DNR should not use the rule to modify, alter or enlarge portions of its enabling statute, or to adopt regulations contrary to the statutes or Nebraska Constitution that it is empowered to enforce.*

In Section 00 l .02B, it is unclear if current voluntary IMPs would exclude a fully appropriated status. We have been working with the voluntary IMP efforts that several NRDs are choosing to implement. These efforts are very helpful, especially when a well-represented stakeholder group is involved with the IMPs. At the heart of the IMPs and fully appropriated methodology are the rivers and the hydrologically connected groundwater. If the IMPs are not adequate to address the surface and ground water declines, DNR should still be able to designate the basin as fully appropriated, even if a voluntary IMP is underway.*

The draft rule and methodology allow for the erosion of instream flow rights by harming existing beneficial uses through allowing additional new uses before a basin is declared fully appropriated.*

The draft rule and methodology ignore likely future changes in water supplies that are expected from climate change.*

The rule could allow IMPs in over appropriated basins to fall short.*

The rule will allow for watersheds being declared fully appropriated only when virtually every acre-foot of water within the watershed is included within an existing water permit or right. Basically, controls or restrictions would not apply until rivers are figuratively, if not literally, dried-up. Controls and restrictions should apply long before exhaustion.*

ENVIRONMENTAL CONSIDERATIONS

In Section 4.3.4 of the draft methodologies, the Department concluded that, at this time, any designation of not fully appropriated will not result in noncompliance with Federal law in any of the basins evaluated. We disagree. The Department's authorization of water development actions under a not fully appropriated designation could facilitate take of federally listed species within certain basins.*

We are concerned about the protection of instream flows for the Niobrara River within the Niobrara National Scenic River and the Missouri National Recreational River in northern Nebraska. These reaches of the Niobrara River were designated by Congress in 1991 as part of the Wild and Scenic Rivers system.*

The newly proposed rules do not specifically address how DNR will meet requirements of LB 962 to protect all beneficial uses, including uses for fish and wildlife, which do not have an appropriation to protect them. Fish, wildlife, and the water sustaining them are all public trust resources, and the State of Nebraska has a fiduciary responsibility to protect these resources.*

Nebraska has yet to develop basin or statewide flow criteria to support ecologically sustainable water resource planning and management.*

The DNR needs stronger rules to protect instream flows of Nebraska's rivers. The draft rules should be revised to protect Nebraska streams and the biodiversity they support.*

Neither the draft rule nor the methodology discuss how the rule will honor Nebraska’s Public Trust obligations, nor how it will consider existing water uses (including for fish, wildlife, and recreation) that are not protected by a specific instream flow appropriation in determining whether a basin is fully appropriated.*

A new rule should be put in place for watershed planning and controls as soon as new uses are having an impact on existing water rights, wells and instream flows and should be made that better protects instream flow water rights for fish and wildlife against harm from new uses.*

The draft rule does not account for state protected species requirements.*

A new rule should be developed that better protects instream flow water rights for fish and wildlife against harm from new uses.*

You need to adopt a rule that better protects instream flow water rights for fish and wildlife against harm from new uses.*

I urge the DNR to draft a new rule, one that actually protects instream flows for fish and wildlife.*

The draft rule fails to protect instream flow water rights for fish and wildlife against harm from new uses. Watershed planning and controls should be put in place to prevent new uses/demands from impacting instream flows.*

RELATIONSHIP BETWEEN RULES AND METHODOLOGY

Could a rule be developed describing the process of information gathering when ideal data is not available?
The issue with creating a check list for gathering data comes when the checklist has been exhausted and the analysis is still required to be completed.

The incorporation (or reference) of the methods in the rules is an important example of what is expected from this process; without the incorporation, the rules do not provide any expectation for the process or how it will be applied.
You know the evaluation will look at water supplies and water uses and what elements will be used to determine the water supply and water usage; you know that a representative period will be determined to evaluate the balance of water supplies and water uses; you know that an irrigation season and non-irrigation season will be evaluated. What is unknown is the specific data and model that may be used to calculate usage. In order to preserve adaptability and flexibility, the methods are not incorporated into the rules.

As previously mentioned, the rules are to be set from year to year with the methods having more adaptability; this has created some uncertainty in the NRDs ability to manage between over appropriated and fully appropriated. More language should be incorporated into the rules to provide for a more definite link to the methodology. Can this language be added into the rules?
The DNR anticipates the evaluation will be completed in conjunction with the local NRDs. Past experiences have underscored the necessity for methods to be flexible and allow the state to collaborate with local NRDs. If it is preferred that the state set the methodologies and not work as closely with the NRDs, that approach can be taken. A technical group in the Platte Basin – consisting of the five NRDs in the basin and the DNR – will be completing the technical analysis; this review process is integrated in each NRDs IMP process. Information gained during the evaluation is used by the NRD to establish the next set of goals and objectives; statues require the DNR and NRD reach a consensus in regards to the next set of rules and objectives.

The desire to retain flexible methods removes from water users the ability to predict how the DNR will decide to do calculations. Concerns surround the DNRs ability to include or exclude certain factors in the evaluation process.
The rules should be considered in conjunction with the methods. The intervening time between the preliminary evaluation and the final evaluation allow for a reevaluation of the determination; water user needs can be incorporated into this intervening process.

The methods seem to encapsulate that models are inconsistent throughout the state; different tools could be selected to apply the methods. The Supreme Court ruled the rules were required to be written in such a way that different parties could reach the same conclusions using the same data. If the methodology is not provided, the rules lack necessary details to accommodate the requirements of the Supreme Court.
Those are legal matters; the DNR has consulted with their attorney to determine the appropriate balance between the details in the rule and the flexibility of the rules to accommodate the information in the methods.

Part 001.01A of the draft regulations states that the annual evaluation of basin water use and supplies will occur over a "representative period of record" as determined most appropriate by the DNR. In addition, Item (6) of 001.01C states "the proportionate amount of BWS necessary to meet demand downstream" will be included in a basin's uses, implying the DNR will determine the "proportionate" amount to be included. However, the lack of specific cross-reference between the draft regulations and the methodologies document does raise concerns. Thus, we would strongly urge the DNR to consider either: a) specifically incorporating some of the content of the draft methodologies document directly into the regulation where appropriate; or b) simply referencing the methodologies document within the regulations where appropriate.*

A critical flaw in the draft rule is the notion that DNR can calculate the total amount of water that flows in or drops on a river basin (the Basin Water Supply), and the amount of water demanded or used, and that if on average the Basin Water Supply exceeds the Total Use then new uses of water in the watershed must not be impacting existing surface or groundwater uses. This approach counts un-usable water as usable and will allow NRDs and DNR to continue to grant new permits and water rights well after the point where specific water users were experiencing impacts.*

The details of the Draft Methodology should be a part of the Rule.*

The draft rules lack sufficient detail relating to of the status/role of the Methodology.*

To ensure consistency and ensure the methodology is repeatable from year to year the methodology to be used by the DNR must be included in the rule.*

More information is needed about determination methods*

The methodology document is not cited in the draft rules, including Section 002 which purports to list the information to be considered by DNR in making preliminary determinations.*

COMMENTS RELATED TO RULES SECTIONS

According to the draft rules, a pivot depletes the river one-tenth of what is run. This is an average, a pivot could deplete more or less than ten percent of what they run; depletion is relative to the wells proximity to the stream and properties of the aquifer.

According to the rule, a preliminary determination of fully appropriated will be reached when the volume of annual basin uses exceeds the supplies, across time. In theory, this would mean a cumulative deficit of one acre-foot could mean a basin is preliminarily determined to be fully appropriated. Given the uncertainties and assumptions made in calculating both uses and supplies, DNR should consider utilizing a range for triggering a preliminary determination rather than an absolute standard. For example, if the amount by which uses exceeded supplies was greater than a specific percentage of the basin's average annual supplies, then the basin would be declared preliminarily fully appropriated.*

The proposed rules do not state how they will address any of the three (3) criteria in 46-713(3) for determining if a basin is fully appropriated. This section states that individual appropriations are to be evaluated, not the sum of all appropriations. The proposed rules summing to appropriations is flawed because the methodology does not consider the location of use within the basin, subbasin, or reach, the timing of use within the evaluation period, and the priority of appropriations inherent to the surface water system.*

Section 46-713(1)(b) requires DNR to make a determination as to whether a preliminary determination is fully appropriated without additional uses would change if no additional legal constraints were imposed on future development with reasonable projects of the extent and location of the development made. There is nothing in the draft rules or methodology about how DNR would fulfill those requirements.*

001.01A - there is no basis in the statute (46-713) for splitting the annual review into parts of the year, June 1-August 31 or Sept. 1- May 31.*

001.01A states that specific evaluation periods will comprise June 1 through August 31 and September 1 through May 30. Those periods are not adequate, especially for the irrigation season. It is not appropriate to compare total supplies in one part of the period (early June) against demands in a different part of the same period (late August). Excesses may occur at one time (e.g., one week or month) and shortages which can damage crops in another week or month and totaling will shadow the non- sustainable low periods and potentially devastate the crop or short the industrial or municipal use. Additionally, the analysis needs to include a drought period. In wetter and average years many of the needs of the basin can be met. It is in the dryer periods that over

development are apparent and planning needs to be implemented to avoid existing or future conflicts. This is the intent of the legislation recommended by the Water Policy Task Force. Wetter periods cannot offset dryer periods, making the DNR proposed rules flawed.*

The draft version of 457 NAC 24.001.0 lA, along with § 4.1.1.1 of the Draft Methodologies, split the annual evaluation into two time periods, June 1 through August 31 and September 1 through May 31, the District questions the basis for this time period selection and believes the logic behind the selection should be made available for discussion. A need may exist to use different time periods for different uses.*

Several references were made in the meetings to "irrigation season" and "non-irrigation season." DNR staff at times described the irrigation season as running from June through August of each year, and the non-irrigation season running from September through May of each water year. Although it is unclear how those assumptions may affect the application of the proposed rule, the irrigation season on the Platte system in the Panhandle of Nebraska is often significantly longer. Although the draft rule under consideration does not mention or define irrigation season, we want to make sure there is no misunderstanding or misapplication of the rule, which would come about by a misunderstanding of the actual irrigation season in this part of the State (and perhaps other areas).*

457 NAC 24.001.0 lA and Section 4.1.1.1 reference the "representative period of record": DNR's intention for this important variable should be available for review and comment by interested parties.*

001.01A states that the time period to be used will be a "representative period of record, which the Department determines is most appropriate." No criteria identified for decision making except absolute discretion of DNR. It appears the period of record can change depending on factors only known to DNR.*

001.01 B provides for the calculation of the basin water supply. The term is misleading in that what is calculated does not represent the total water budget supply which would include precipitation and water flowing into the basin. It should be described as the adjusted gauged inflow unless other terms are included. Some of those terms include: conservation activities undertaken to increase water consumption, consumption from induced recharge appropriations, groundwater which seeps from the streambed and then reappears as surface flows in another basin, changes in groundwater storage, natural flow for storage, changes in available storage, and Environmental Account water quantities.*

001.01 C provides for the calculation of the Total Use of groundwater and surface water. The term is misleading in that the uses listed are not all those which use groundwater and surface water. The rule should include at least the

following: domestic uses, municipal uses, conservation activities undertaken to increase water consumption, groundwater which seeps from the streambed and then reappears as surface flows in another basin or groundwater recharge, evaporation, phreatophytic uses, and consumption from induced recharge appropriations.*

001.01 D seems to give DNR the ability to create a standard on the fly for any other uses. This opens DNR to the challenge of making arbitrary decisions. All standards and decision criteria must be included in the rules.*

Both the draft version of 457 NAC 24.001.02B-C along with § 4.1.1.2 of the Draft Methodologies, give too much priority to future uses by delaying the determination of fully appropriated status.*

The annual use of computer models and determinations of representative periods deserves technical validation that does not include DNR Staff. Outside peer review thus offers an opportunity to: validate the technology, modeling, and judgment applied in decision making; and provide insight into continuing technical research within Water Resources.*

Both the draft version of 457 NAC 24.001.02B-C along with § 4.1.1.2 of the Draft Methodologies appear to simply assume that the IMP's controls enacted by numerous NRD's will be coordinated and effective and appears to allow for the Department to change the determination without a full reevaluation. *

In the case where full appropriation is needed to protect existing uses; 457 NAC 24.001.02 B-C will cause inordinate delays and inaction. The result could easily be critical shortages and an eventual determination of over appropriation.*

001.03 - the "10/50" definition is (1) not consistent with the scientific definition of hydrologically connected; (2) not consistent with the statutes in Section 46-713(1) (a) and (b); (3) may unnecessarily limit the DNR or the NRD in administrating the designation of the geographical area of the hydrologically connected surface and groundwater. The intent of the statutes is clear in that the entire hydrologically connected area, not an arbitrary portion of it, was to be used for the evaluation as to sustain the beneficial and using purposes of existing surface water and groundwater users. Doing so will be in the best interest of existing surface water and groundwater users and will enable appropriate measures to be developed in the integrated management plan that will provide for new uses of water in a fair and equitable manner.*

001.03 provides no explanation or justification for the weak 10/50 standard. The rule should set a stronger standard that uses the best information available to determine where groundwater and surface water are hydrologically connected.*

002 lists all of the information that DNR will use in making their determination. Ground water levels (which are included in the existing rules) and changes in aquifer storage are necessary components of determining impacts on existing uses. Recent findings of wells going dry, new steps taken by NRDs to avoid conflict, etc., must be included, just as records of surface water regulation which are included on the list of data. Additionally, the list of data does not include the surface water appropriation database which is necessary for determine impacts to individual appropriations and maps of registered wells which is necessary to evaluate impacts on aquifers dependent of stream flow for recharge.*

DNR's proposal regarding Total Use falls short of properly capturing all of the appropriations or associated surface water uses that should be considered, and so any assumption that the Total Use approach satisfies the statutory requirements is not valid.*

The draft rule counts water in the river as available to offset against demands even when the rate and timing of that streamflow is such that it would not actually be able to be used. This greatly increases the likelihood that the Department would fail to appropriately identify that a basin is fully appropriated even though in reality the water supply would be insufficient to meet beneficial uses.*

The draft rule contains no description of how, or whether, an evaluation of shortages to streamflow needed for recharge for wells would occur.*

Nebraska statute requires that determination of fully appropriated status depends not only on whether or not there are certain water supply shortages, but also whether those shortages are caused by certain uses; however, the draft Rule provides no indication as to whether or how such causes would be considered.*

The Draft Rule fails to consider not only whether then-existing uses cause water supply shortages, but also to look forward in time and judge whether those uses "will in the reasonably foreseeable future cause" those shortages (Nebraska Revised Statute 46-713(3)). *

There is nothing in the statutes that supports use of the 10/50 Line, and it should not be used in either the current rule or the Draft Rule.*

The draft rule fundamentally misinterprets statute as applied to instream flows: Nothing in the statute suggests a disparate treatment of instream flow appropriations vastly different from any other type of appropriation, with the minor exception that the beneficial or useful purpose is not allowed to change from what it was when granted.*

Figure 1 indicates that 23 gauges will be used in evaluation of appropriation status and does not identify the location or type of gauge(s) at these locations.

More information must be provided on these gauges with further justification of how 23 are adequate to determine the appropriation status at the basin, subbasin or reach scale.*

COMMENTS RELATED TO METHODOLOGY

Was any consideration given to providing a buffer around zero so it is not an absolute threshold?

That is something the DNR could consider; however, it would have to be a percentage and not an absolute threshold since not all basins hold the same amount of water.

Could the current methods be used for a few more years until the direct impact of downstream demands to upstream NRDs is fully understood?

An evaluation will be done at the end of this year. If the rules are not passed, the old rules and methods will be used. Other entities in the state are affected by the rules and are planning for the rules change. The goal of the evaluation is to protect existing water uses and proactively manage water balances.

Why can't the current methodology be used for downstream analysis?

The current methodology does not have a component for downstream analysis. The current methods look at junior water rights in the system; if junior water appropriators have at least 65% of their water needs during July and August and 85% of their overall irrigation needs, there is no need to designate. This is based on the number of closures the DNR administers on the surface water system. This methodology could be applied; however, it does not lend itself well to the current IMP goals in the over appropriated basin.

Statute referenced in section 4.2.4.3 in the methodology does not restrict to flows or current uses at time of appropriation; instead, it refers to the current beneficial uses at time of appropriation.

The DNR's interpretation of that statute is to look at the levels of development that were in place at the time of appropriation; this has not changed significantly from the previous rules, aside from the recognition of ground water development.

Adding up water surpluses and water deficits over the representative period is not the best practice; instead, a trend analysis should be used to determine the effect of previous factors on current conditions. Other methodologies should be considered.

The representative period will continue to proceed; it is not a static time frame. Trends in the data will be captured over a series of years. The result of the evaluation is not to ensure against periodic shortages; instead, the evaluation will determine if physically there is enough water in the system to balance out over a period of years.

Hydrologically connected areas are streams that are fed by groundwater. The rules indicated that the USGS Perennial Stream Map would be used to identify

hydrologically connected areas. Within the Blue Basin, there is a considerable area that is not hydrologically connected.
In this area a ground water model is being developed; the groundwater model will be used to calculate a 10/50 area. HDR is developing this model.

The intent to those involved in the Water Policy Task Force was to trend the evaluation forward to begin the planning process. The evaluation should look to the future, not the past. Assumptions should not be made on the use of water.
In concept, the line of balance could be determined at any point.

The selection of the period of record can lead to large discrepancies in water supply estimates if the period is not representative. The methodology should ensure that the representative period captures the characteristics of past and future climactic conditions.*

The Draft Methodology fails to discuss how it would be used in already overappropriated basins, such as the Platte, for determining overall difference.*

The number of long term stream gauges on the Niobrara River that will be used to determine the status of a basin is insufficient. In areas where both surface water and groundwater irrigation are occurring, return flows may be captured by groundwater pumping and may not discharge to the river or may take longer to reach the river. DNR must consider both the spatial and temporal distribution of return flows and the potential for individual reaches to be dewatered in determining whether a basin is fully appropriated.*

The gauged flows data should be subject to daily evaluations of what can be used. DNR could consider a methodology to cap the flow used in the calculation, not capping daily gauged flows will cause calculated volumes appear more useful than they actually were. This methodology is flawed and the dry periods must be evaluated independently to achieve the intent of the statutes.*

It is unclear how the period of record chosen for the stream gauges will be confirmed as representative of what is actually happening in the basin on a long term basis.*

Under the best science available standard, NDNR should consider requiring measured ground water pumping as opposed to estimated pumping, and we believe must do so if estimated pumping is used in the application of the rule and planning process of one NRD which has the effect of attributing any increased downstream demands on upstream NRDs.*

It is unclear how the lag effect from the development of groundwater wells will be captured in the methodology.*

Section 4.1.2 of the methods outlining the steps to determine hydrologically connected areas should be revised to clarify that the aquifer that is being pumped does not have to be the principal aquifer in the area to cause reductions in stream flow. This would recognize that wells drilled within a minor aquifer adjacent to the river can deplete a river's flow, even if the aquifer that is being pumped is not the principal aquifer in the area.*

Evaluating the supply of water leaving a basin does not meet the statutory requirements in 46-713(3) that require determination of impacts of surface water uses on groundwater supplies/uses and impacts from groundwater uses on surface water uses. Estimates of supplies leaving a basin would be important for planning purposes, not evaluating whether or not a basin is fully appropriated. The proposed rules are dependent on the basin, sub basin, or reach having a stream gauge at the end. In response to questions at the public information meetings, DNR stated that they would determine appropriate methodology for basins without a gauge. The proposed rules could not then be implemented.*

Section 4.2 of the methods should include the ability to adjust model results based on known limitations or biases of the models in question.*

The methodology utilized in§ 4.3. l – Determination of Current Basin Water Supplies should exclude periods of "excessive" streamflow that is in actuality not available for surface water use or capable of satisfying groundwater depletions. The "excessive" streamflow skews upwards the total Basin Water Supply and has the effect of eroding the protection that§ 46-713 should provide current users.*

Section 4.3.1.4 - Final Basin Water Supplies, references the natural dry or wet hydrologic cycles and the District certainly concedes that these cycles exist, but the District questions whether it is entirely appropriate to try to eliminate any bias in the data. Data that is slightly biased toward dry years would seem to provide the protection from the erosion of water rights when municipal and irrigation users need the protection most.*

The draft methodology 4.3.2.1and 4.3.2.2 has a very simplistic approach to calculating the amount of water returned through a municipal system.*

The reference in Section 4.3. l to "streamflow is impacted by human activity; therefore" implies that the described process then creates an un-impacted supply. However, the described process does no such thing. Also, it is not certain why it would even be necessary to create a supposedly un-impacted supply, as each new use should expect to have to and get make use of the river as it now finds it.*

Sections 4.3.2.l and 4.3.2.2 do not state how co-mingled acres are to be addressed.*

Sub-Section 4.3.4 titled Evaluation of Compliance with Compacts, Decrees, Agreements, and State and Federal Laws suggests that only those federal laws associated with the taking of threatened or endangered species are of concern if reductions in stream flow occur following the determination that a basin is not fully appropriated. Reductions in stream flow could cause noncompliance with federal laws in addition to the Endangered Species Act of 1973 (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.), including the National Park Service Organic Act of 1916 (16 U.S.C. §§ 1-18f), the Wild and Scenic Rivers Act (16 U.S.C. § 1271-87, P.L. 90-542,), and the Niobrara Scenic River Designation Act (P.L. 102-50), which are applicable to the Niobrara River reaches that have been designated as part of the Wild and Scenic Rivers system. Reductions in flow or changes in the timing of flows could result in flows that are insufficient to achieve the purposes of these federal laws and, therefore, must be considered when determining the fully appropriated status of the lower Niobrara River basin.*

Section 4.3.4 disregards that further groundwater and surface water development that will impact key flows needed by protected species.*

In section 4.3.2.5, no reason is given for setting hydro demand at zero for any days that historically had zero diversion.*

Section 4.3.4 lists the Blue River Basin as the only basin that is not fully appropriated and subject to an interstate compact, decree, or agreement. It would be more precise to state that the Blue River Basin is the only basin that is not fully appropriated for which a reduction in flow may result in noncompliance with an interstate compact, decree, or agreement.*

Section 4.3.2.6 allocates responsibility for meeting downstream consumptive and non-consumptive uses: this is unsupported by statute.*

The methodology is incomplete and inappropriate as it does not contain details on storage reservoirs and storage water demands. DNR will need those details to include in the evaluations of the Loup River for 2014 and ultimately the Niobrara River.*

The proposed methodology is flawed until the methodology includes details on how storage water flowing past stream gauges will be accounted for. DNR will need those details to include in the evaluations of the Loup River in 2014 and ultimately the Niobrara Basin.*

The existing and proposed methodology needs to include details and evaluation of impacts from comingled land demands.*

The calculated demands for surface water must include the canal and field delivery efficiency demands to be complete.*

The proposed methodology appears to allocate surface water demands upstream for meeting downstream needs and does not consider the priority system of surface water and therefore the ratio method proposed may either underestimate or overestimate the true demand. For example, if the surface water demands upstream are junior to those downstream of the gauge, the ratio method may overestimate the upstream demand.*

Induced recharge appropriations need to be considered in that they have a non-consumptive in river component and a river depletion component.*

DNR is misinterpreting 46-713(3}(a) in the methodology document. The statute interpretation must be based on a reading in whole with knowledge of instream flow appropriations. The statement "the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted" must be read in context that instream flow appropriations are granted a flow for a specific purpose, i.e. whooping crane roosts or least tern nesting and therefore, if that specific use is not needed or goes away, it should not be considered into the future.*

The methodology ignores future increases in municipal and industrial water use that is already under permit, as well as existing municipal needs.*

The proposed methodology for determining hydropower demands is not acceptable in that it would set the daily demand to zero when there was no water available for diversion.*

APPENDICES

APPENDIX A:
Draft Rules Title 457, Chapter 24

NEBRASKA ADMINISTRATIVE CODE

Title 457 - DEPARTMENT OF NATURAL RESOURCES
RULES FOR SURFACE WATER

Chapter 24 - DETERMINATION OF FULLY APPROPRIATED BASINS, SUB-BASINS OR REACHES

001 FULLY APPROPRIATED. Pursuant to Neb. Rev. Stat. § 46-713(3) (Reissue 2004, as amended) A river basin, subbasin, or reach shall be deemed fully appropriated if the Department of Natural Resources (Department) determines based upon its annual evaluation and information presented at hearings subsequent to a preliminary determination of fully appropriated that then-current uses of hydrologically connected surface water and groundwater in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause (a) the surface water supply to be insufficient to sustain over the long term the beneficial or useful purposes for which existing natural flow or storage appropriations were granted and the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted, (b) the streamflow to be insufficient to sustain over the long term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved, or (c) reduction in the flow of a river or stream sufficient to cause noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws.

001.01A For purposes of Section 46-713(1) (b), the Department shall reach a preliminary conclusion that a river basin, subbasin, or reach is fully appropriated if based on the Department's annual evaluation, it is determined that Total Use of hydrologically connected groundwater and surface water exceeds the basin water supplies (BWS) for the period of June 1 through August 31, inclusive, or the period of September 1 through May 31, inclusive, over the representative period of record, which the Department determines is most appropriate for this purpose and thereafter utilized by the Department to conduct the analysis.

001.01B For purposes of 001.01A, the BWS is the streamflow water supply estimated to be available without the initiation of groundwater pumping from high capacity wells and surface water uses of natural flow and storage. The BWS is calculated by summing the following: (1) gauged streamflow; (2) streamflow depletions due to high capacity well groundwater pumping; and (3) consumptive surface water uses.

001.01C For purposes of 001.01A, the Total Use of groundwater and surface water is calculated by summing the water demands associated with the following activities: (1) consumptive water demands for hydrologically connected high capacity (greater than 50 gallons per minute) groundwater well pumping; (2) consumptive water demands for surface water uses; (3) the net water determined to be necessary to deliver streamflows to meet consumptive surface water uses; (4) streamflow available to meet instream flow

appropriations at the time the appropriation was granted (accounting for all development in place at such time the appropriation was granted); (5) any additional streamflow demands for hydropower operations not accounted for in the instream flow water demands; and (6) the proportionate amount of BWS necessary to meet demands downstream of a basin, subbasin, or reach that are not already reflected in the first five water demands within this section.
001.01D In the event that water rights are for a beneficial use other than irrigation, municipal, industrial, instream flow, or hydropower, (for example flood control, aquaculture, etc.) the Department will evaluate such use and if necessary determine a standard to incorporate such right into any relevant analysis, taking into account the purpose for which the appropriation was granted.

001.02A For purposes of Section 46-713(3), the Department shall deem a basin, subbasin, or reach as fully appropriated if such preliminary determination is reached pursuant to 001.01A and if information provided at a subsequent hearing pursuant to subsection (4) of section 46-714 does not indicate that the criteria set forth in 001.02B or 001.02C apply or that additional information relevant to its annual evaluation has been identified and if utilized would result in a different conclusion than that reached pursuant to 001.01A.

001.02B For any basin, subbasin, or reach preliminarily determined to be fully appropriated pursuant to 001.01A in which integrated management plan(s) have been initiated by all Natural Resources Districts within the hydrologically connected area, the Natural Resources Districts within that same hydrologically connected area have designated a management area for which a purpose is the integrated management of hydrologically connected groundwater and surface water, and the Natural Resources Districts and Department have not taken more than three years to complete such integrated management plan(s) the Department may reach a final determination that such basin, subbasin, or reach is not fully appropriated at that time.

001.02C For any basin, subbasin, or reach preliminarily determined to be fully appropriated pursuant to 001.01A in which integrated management plan(s) have been completed by all Natural Resources Districts within the hydrologically connected area the Department will review the contents of such integrated management plan(s) to ensure that appropriate limitations on new water uses are included in such integrated management plan (s), inclusive of controls on such new uses pursuant to Neb. Rev. Stat. § 46-739 (6)(b), and such integrated management plan(s) includes a plan to monitor water uses in a manner consistent with rule 001.01A-D. Upon the Department completing this review the Department may reach a final determination that such basin, subbasin, or reach is not fully appropriated at that time.

001.03 The geographic area within which the Department preliminarily considers surface water and groundwater to be hydrologically connected for the purpose prescribed in Section 46-713(3) is the area within which pumping of a well for 50 years will deplete
the river or a base flow tributary thereof by at least 10 percent of the amount pumped in that time.

002 INFORMATION CONSIDERED. For making preliminary determinations required by Neb. Rev. Stat. Section 46-713 (Reissue 2004, as amended) the Department will use the best scientific data and information readily available to the Department at the time of the determination. Information to be considered will include:

1. Department records on the regulation of surface water appropriations
2. Department maps of surface water appropriations
3. Department Hydrographic Reports
4. Department and United States Geologic Survey stream gauge records
5. Department's registered well data base
6. Technical hydrogeological reports and Publications subject to Department peer review
7. Department reviewed groundwater models and resulting model outputs
8. Certified irrigated acres provided by the Natural Resources Districts
9. Water use information provided by other state agencies, natural resources districts, irrigation districts, reclamation districts, public power and irrigation districts, mutual irrigation companies, canal companies, municipalities, and other water users
10. And other information deemed appropriate by the Department for the purpose of conducting the determination

EFFECTIVE DATE: DATE, 2013

APPENDIX B:
Timeline for Assessment and Potential Modification of Department's Rules Related to its Determination of Fully appropriated Basins, Subbasins, or Reaches

Timeline for Assessment and Potential Modification of Department's Rules Related to its Determination of Fully Appropriated Basins, Subbasins, or Reaches

2009	Fall 2009	Integrated Management Plans and the Basin-wide plan in the Overappropriated portion of the Platte River Basin are completed.
	Winter 2009	Initial Interviews are conducted by a consortium of Platte Basin interest, including the Natural Resources Districts and surface water irrigation and public power interest within the overappropriated area. These interviews result in the awarding a contract to HDR and the Flatwater Group (Consultants).
2010	Spring 2010	The Consultants are directed to perform a literature review of processes utilized in other states and under other water sharing agreements. This review was made available with recommendations of a new conceptual approach to the Department's evaluation process. Link to the review.
	Spring 2010	Central Platte NRD and Twin-Platte NRD, representing all of the Overappropriated Platte River Basin NRDs receives funding state funding through the Interrelated Water Management Plan Program Funds to support evaluation of the Department's current rules related to its Determination of Fully Appropriated Basins, Subbasins, or Reaches and to work toward identifying the overall difference between overappropriated and fully appropriated. Link to the application.
	Spring 2010 through Spring 2011	The Consultants finalize initial testing of the new conceptual approach with tested recommendations. This culminates in a stakeholder meeting at the Central Platte NRD where invited participants include diverse water interests from across the state. Link to the presentation.
2011	Fall 2011	Comments and feedback from the stakeholder meeting are evaluated and incorporated in a final report. This report is made publically available detailing the conceptual approach and includes modification recommended at the stakeholder meeting. Link to the report.
	Fall 2011 through Fall 2012	The conceptual approach is expanded to test increasing complexities associated with the overappropriated portion of the Platte River Basin.
	Fall 2011 through Present	Periodic updates are provided by the Central Platte NRD and Department at the Platte Overappropriated Committee Meetings held in North Platte. The study is a reoccurring agenda item for discussion at each meeting. The Department, OA Platte Basin NRDs, and various other water interests in the overappropriated portion of the Platte River Basin are in attendance at these meetings.
2012	August 2012	The consultants present on the new conceptual approach at the NRD managers meeting hosted by Papio-Missouri River Natural Resources District in Omaha. Link to the presentation.
	November 2012	Department presents on new conceptual approach at the UNL Water: Science, Practice, and Policy Conference. Link to the presentation.
2013	January 2013	The Consultants finalize testing of the new conceptual approach with final recommendations for the entire Platte Basin. This culminates in a stakeholder meeting at the Central Platte NRD where invited participants include diverse water interests from across the state. The Department also lays out its plan for public review of new rules changes. Link to the presentation.
	January 2013	The consultants present at the NARD Legislative conference in Lincoln. Link to the presentation.
	April 2013	The Department disseminates new draft rules for a 60-day public comment period ending June 7th. In addition to the draft rules and methods, a final report from the consultants is published and datasets utilized in their analyses are made publically available. Link to the final report. Link to supporting data for the final report. Link to the Department's Draft Rules. Link to the Department's Draft Methods.
	April 2013 through June 7th, 2013	The Department will hold public question and answer sessions at the following locations and times: Date / Time / Location Monday, May 13, 2013 — 9:00 a.m.-11:00 a.m. — Norfolk – Holiday Inn Express, Meeting Room B, 920 S. 20th Street Monday, May 13, 2013 — 4:00 p.m.-6:00 p.m. — Valentine – Niobrara River Lodge, Minnechaduza Room, 803 E. Hwy 20 Tuesday, May 14, 2013 — 8:00 a.m.-10:00 a.m. — Scottsbluff – Hampton Inn & Suites, Sandstone Room, 301 W. Hwy 26 Tuesday, May 14, 2013 — 4:30 p.m.-6:30 p.m. — Kearney – Holiday Inn Hotel and Convention Center, Room D, 110 Second Avenue Wednesday, May 15, 2013 — 9:00 a.m.-11:00 a.m. — Beatrice – Holiday Inn Express, Lincoln-Omaha Room, 4005 N. 6th Street Thursday, May 16, 2013 — 1:30 p.m.-3:30 p.m. — Lincoln – Nebraska State Office Building, Lower Level F, 301 Centennial Mall South These sessions are intended to obtain feedback on the draft rules so that final draft rules can be developed for subsequent hearings. Details on the exact date, time, and location of these sessions will be added to the Department's website shortly. Comments on the draft rules and methods may also be provided online. Provide a comment. Link to the letter regarding public meetings.
	Summer 2013	The Department will hold public hearings on the draft rules for final public comment on the draft rules.
	Fall 2013	The Department will assess comments from the public hearing process and determine if the rules will be finalized.

APPENDIX C:
Draft Methodologies

4.0 METHODOLOGY

This section provides an overview of the methodologies used in the Department's annual basin evaluations and is separated into four sub-sections.

1. The first sub-section (4.1) outlines the legal requirements established in § 46-713 of the Ground Water Management and Protection Act (Act) (*Neb. Rev. Stat.* §§ 46-701 through 46-754) and 457 *Neb. Admin. Code* (NAC) ch. 24 as they relate to the analysis.
2. The second sub-section (4.2) discusses the specific methods implemented by the Department to calculate the extent of the hydrologically connected area (10/50 area).
3. The third sub-section (4.3) provides the overall procedure for determining whether a preliminary determination of fully appropriated is required.
4. The fourth sub-section (4.4) describes an additional statutorily required analysis used to assess how the preliminary determination reached in sub-section three would change if no additional legal constraints were imposed on future development.

4.1 Legal Requirements

The methodologies used for evaluation within this report were developed to meet the requirements of § 46-713 of the Act. The determination of fully appropriated is guided not only by § 46-713 of the Act, but also by Department regulations, Chapter 24 of Title 457 of the Nebraska Administrative Code. The two documents work in partnership to provide clarity and transparency to the process by which a basin may be determined to be fully appropriated. The statute specifies the framework upon which the regulations develop further definition. § 46-713 sets forth the following criteria, requiring the Department to: 1) describe the nature and extent of surface water and groundwater uses in each river basin, subbasin, or reach; 2) define the geographic area within which surface water and groundwater are hydrologically connected; 3) define the extent to which current uses will affect available near-term and long-term water supplies; and 4) determine how preliminary conclusions based on current development would change if no additional legal constraints were imposed on reasonable projections of future development. Chapter 24 of Title 457 goes on to provide four (4) significant guideposts for the development of methodologies used to determine the appropriated status of a basin. The first provides specification for the preliminary determination of fully appropriated, the second for the final determination of fully appropriate, the next for the determination of the hydrologically connected area and the fourth for the type of scientific data and information that will be considered when making a fully appropriated determination. Each guidepost is further described below.

4.1.1 Determination of Fully Appropriated (§46-713(3) and Regulation 457 NAC 24.001)

Neb. Rev. Stat. §§ 46-713 (3) generally states that ***a basin is fully appropriated if:*** current uses of hydrologically connected surface water and groundwater in a basin cause, or will cause in the reasonably foreseeable future, (a) the surface water to be insufficient to sustain over the long term the beneficial purposes for which the existing surface water appropriations were granted, (b) the streamflow to be insufficient to sustain over the long term the beneficial uses from wells constructed in aquifers dependent on recharge from the basin's river or stream, or (c) reduction in streamflow sufficient to cause Nebraska to be in noncompliance with an interstate compact or decree, formal state contract, or state or federal laws.

Regulation 457 NAC 24.001 provides for a two-step process for the Department to reach a determination of fully appropriated. The first step is a preliminary determination based on an annual evaluation of the balance between water supplies and water uses/demands. The second step is to hold public hearings and review information provided at the hearings and consider additional facts (scientific information, current integrated management planning efforts, and associated management areas and controls) available subsequent to the preliminary determination. It is only after following both of these steps that the Department would reach a final determination that a basin, subbasin, or reach is fully appropriated.

4.1.1.1 Preliminary Determination of Fully Appropriated

Regulation 457 NAC 24.001 more specifically defines how Neb. Rev. Stat. § 46-713(3) is applied to reach a preliminary conclusion regarding a basin's appropriation status. The regulation states that the Department shall reach a preliminary conclusion that a river basin, subbasin, or reach is fully appropriated based on the Department's annual evaluation, if it is determined that Total Use of hydrologically connected groundwater and surface water exceeds the Basin Water Supplies for the period of June 1 through August 31, inclusive, or the period of September 1 through May 31, inclusive, over the representative period of record, which the Department determines is most appropriate for this purpose and thereafter utilized by the Department to conduct the analysis.

As a final step in the Department's preliminary determination, the Department is also required, pursuant to *Neb. Rev. Stat.* §§ 46-713 (1) (b) to assess how its preliminary conclusions, based on current development, might change by predicting future development. The predictions of future development account for existing development trends and project development that may be added in the next twenty-five years. Because the Department does not use this portion of the evaluation in the determination of basin status, no further specifics are defined in Department Rules and Regulations.

4.1.1.2 Final Determination of Fully Appropriated

The Department will reach a final determination that a basin, subbasin, or reach is fully appropriated if the Department determines that, based upon its annual evaluation (the criteria established in 457 NAC 24.001.01A-D) and information presented at hearings held subsequent to a preliminary determination of fully appropriated, that the following conditions apply:

1. That no additional information relevant to its annual evaluation has been identified that would result in the Department reaching a different conclusion than that reached pursuant the preliminary determination;
2. That all of the natural resources districts in the area preliminarily determined to be fully appropriated have not initiated a voluntary integrated management planning process, designated a management area for which a purpose is the integrated management of hydrologically connected groundwater and surface water, and the natural resources districts and Department have not taken more than three years to complete such integrated management plan(s); or
3. That in the event that an integrated management plan(s) has been completed, appropriate limitations on new water uses are not included in such integrated management plan(s) inclusive of controls on such new uses pursuant to Neb. Rev. Stat. § 46-739 (6)(b), and such integrated management plan(s) does not include a plan to monitor water uses in a manner consistent with 457 NAC 24.001.01A-D.

4.1.2 Determination of Hydrologically Connected Areas (§46-713(1)(a)(ii) and Regulation 457 NAC 24.001.03)

In accordance with §46-713(1)(a)(ii) the Department must determine the geographic area within which surface water and groundwater are hydrologically connected. Regulation 457 NAC 24.001.03 states that the geographic area within which the groundwater and surface water are hydrologically connected is determined by calculating where, in each river basin, a well would deplete a river's flow by ten percent of the amount of water the well could pump over a fifty-year period (10/50 area). The 10/50 area serves as the initial area that would be subject to preliminary stays when a basin is determined to be fully appropriated. If agreed to by both the Department and participating NRD, the 10/50 area can be modified during the development and completion of an integrated management plan.

4.1.3 Utilization of the Best Available Science in the Annual Evaluation (§46-713(1)(d) and Regulation 457 NAC 24.002)

In accordance with §46-716(1)(d), the Department must rely on the best scientific data, information, and methodologies readily available to ensure that the conclusions and results arrived at through the annual evaluation are reliable. All references to "best available science" included in this document will be detailed in the Department's annual evaluation. These references will include such items as model datasets and documentation on specific processes and data used by the Department. The Department

has specified, by rule and regulation, the types of scientific data and other information that will be considered (457 NAC 24.002) in the annual evaluation. This information includes:

1. Department records on the regulation of surface water appropriations;
2. Department maps of surface water appropriations;
3. Department Hydrographic Reports;
4. Department and United States Geologic Survey stream gage records;
5. Department's registered well data base;
6. Technical hydrogeological reports and publications subject to Department peer review;
7. Department reviewed groundwater models and resulting model outputs;
8. Certified irrigated acres provided by the Natural Resources Districts;
9. Water use information provided by other state agencies, natural resources districts, irrigation districts, reclamation districts, public power and irrigation districts, mutual irrigation companies, canal companies, municipalities, and other water users; and
10. Other information deemed appropriate by the Department for the purpose of conducting the determination.

4.2 Determination of Hydrologically Connected Areas (10/50 areas)

The overall Department evaluation procedures compare the Basin Water Supply (water supply) to the Total Use (water uses/demands). The comparison of the Basin Water Supply and Total Use allows for a comparison of the balance between water supplies and water uses. Both Basin Water Supply and Total Use rely upon a series of calculations, which are outlined in section 4.3. To provide context for the remaining sections of the document (4.3 and 4.4), this section outlines the process used to determine the 10/50 area. The determination of this area is essential to calculating consumptive uses associated with groundwater development (a component of the Total Use).

The 10/50 area is defined as the geographic area within which groundwater is hydrologically connected to surface water. A groundwater well constructed in the 10/50 area would deplete river flow by at least ten percent of the volume of water pumped over a fifty-year period. The analysis to develop 10/50 areas is typically not dependent on the quantity of water pumped, but rather on each basin's geologic characteristics (transmissivity and specific yield of the aquifer) and the distance between each well and the stream.

In determining the best available science, the Department reviews available numerical and analytical models to assess their validity in defining the 10/50 area. The Department will determine and utilize the best available science for each basin, subbasin, or reach evaluated. When numerical models are utilized to determine the extent of the 10/50 area for a given stream, the following steps are taken:

1. Prepare numerical model files, as needed, so that at least a 50-year time span is simulated.
2. Prepare and execute a 50-year (or more) baseline simulation in which pumping is not increased above the levels defined in the calibrated model version.
3. Prepare and execute a series of 50-year (or more) simulations, in which additional pumping is defined for a single selected cell in the model for the entire simulation period (different cell locations are selected for each run in the series).
4. Calculate the difference in simulated groundwater contributions to surface discharges over 50 years between the baseline (Step 2) and analysis (Step 3) runs as a percentage of the total volume of additional water pumped over that same period.
5. Assign the percentage calculated in Step 4 to the cells in which additional pumping was defined in Step 3.
6. Delineate the 10/50 area for the modeled basin, subbasin, or reach.

In areas where an appropriate regional numerical model has not been developed, but where appropriate geologic data exist, an analytical methodology may be applied. The following steps are utilized to calculate the extent of the 10/50 area when applying an analytical approach:

1. Evaluate available data to determine if the principal aquifer is present and if sufficient data exist to determine that a given stream reach is in hydrologic connection with the principal aquifer.
2. Collect and prepare data.
3. Complete calculations to delineate the 10/50 boundary for these basins.
4. Develop the 10/50 area.

Two analytical approaches have been identified by the Department for utilization in determining the extent of the 10/50 area. The Hunt Method (Hunt, 1999[1]) is the preferred analytical approach to apply when appropriate numerical models are not available; however, the Hunt Method requires spatially distributed data on streambed conductance. When such streambed conductance data does not exist, the Department utilizes the Jenkins Method (Jenkins, 1968[2]). The Jenkins Method is similar to the Hunt Method with the exception that streambed conductance data is not required. The application of these analytical approaches is outlined through the following steps:

Step 1: Identify Aquifers that are in Hydrologic Connection to Perennial Streams

The locations of aquifers in hydrologic connection to perennial streams are determined using the best available science. The types of information used in this

[1] Hunt, B. 1999. Unsteady Stream Depletion from Ground Water Pumping, *Ground Water*, Vol. 37 (1): 98-102.

[2] Jenkins, C.T. 1968a. "Computation of Rate and Volume of Stream Depletion by Wells." In *Techniques of Water Resources Investigations*. U.S. Geological Survey, Book 4, Chapter D1. Washington, D.C.

assessment include the distribution of groundwater aquifers, perennial streams, and regional water table maps. This information is referenced where used.

Step 2: Data Preparation

Once aquifer locations are identified, availability of additional information must be evaluated. The following data are necessary for determining the extent of the 10/50 area using analytical approaches:

- Aquifer transmissivity,
- Aquifer specific yield,
- Locations of perennial streams,
- Point grid of distances to streams,
- Streambed conductance (to apply the Hunt Method).

Data on aquifer properties (transmissivity and specific yield) will be identified using the best available science. The location and extent of perennial streams will be identified from the perennial streams GIS coverage available from the USGS National Hydrography Dataset. The point grid will be spatially refined to a one- mile grid so that specific distances from the stream to grid nodes can be identified and stored.

Step 3: Analysis

The analysis of locations for determining if a hydrologic connection (ten percent depletion in fifty years) exists is performed following the calculation procedures established through the Hunt Method (when streambed conductance data are available) or the Jenkins Method.

4.3 Procedure for the Evaluation of the Status of each Basin

To evaluate the status of a basin, the Department must evaluate the near-term and long-term water supplies of a basin, subbasin, or reach. The following provides an overview of the process used by the Department to evaluate the near-term and long-term water supplies in each basin, subbasin, or reach. When determining the status of a basin, the Department evaluates three criteria: 1) that the Total Use from current levels of surface water and groundwater development within the hydrologically connected area do not exceed available Basin Water Supplies for the period of June 1 through August 31, inclusive, over the representative period of record; 2) that the Total Use from current levels of surface water and groundwater development within the hydrologically connected area do not exceed available Basin Water Supplies for the period of September 1 through May 31, inclusive, over the representative period of record; and 3) that the basin, subbasin, or reach is in compliance with compacts, decrees, agreements, and all applicable state and federal laws.

If any of these three criteria are not satisfied, then the Department will make a preliminary determination that such basin, subbasin, or reach is fully appropriated. This preliminary determination will be evaluated pursuant to 457 NAC 24.001.02 to determine if a final determination of fully appropriated is warranted.

The discussion below describes the components the Department will use to determine the Basin Water Supply and Total Use of a basin, subbasin, or reach. The Basin Water Supply and Total Use components are described in sections 4.3.1 and 4.3.2, respectively. It is through the comparison of these two items, the Basin Water Supply and the Total Use, that a preliminary determination is made regarding the fully appropriated status of a basin, subbasin, or reach. Section 4.3.3 describes the two comparisons that will be made by the Department to determine whether or not a basin, subbasin, or reach is fully appropriated. Section 4.3.4 describes the evaluation of basin status performed by the Department to meet the requirements of criteria three (3) concerning compliance with state and federal laws.

4.3.1 Determination of Current Basin Water Supplies

The Basin Water Supply represents the water supply that is available for Total Use within a river basin, subbasin, or reach. If no surface water or groundwater use was occurring by humans in a basin, the Basin Water Supply would be represented by the streamflow data captured at a streamflow gaging station. However, streamflow is impacted by human activity; therefore, to calculate a total Basin Water Supply, three water supply components are added together. These three water supply components (gaged streamflow, surface water consumptive uses, and groundwater depletions) are discussed in detail below.

4.3.1.1 Streamflow

The Department has identified the long-term stream gages that it will utilize in its annual evaluation. Figure 1 illustrates the locations of these gages and subbasin areas upstream of each of those gages. The subbasins associated with each of these gages represent the level of refinement that the Department will utilize, within its annual evaluation, for those areas not currently designated as fully or overappropriated.

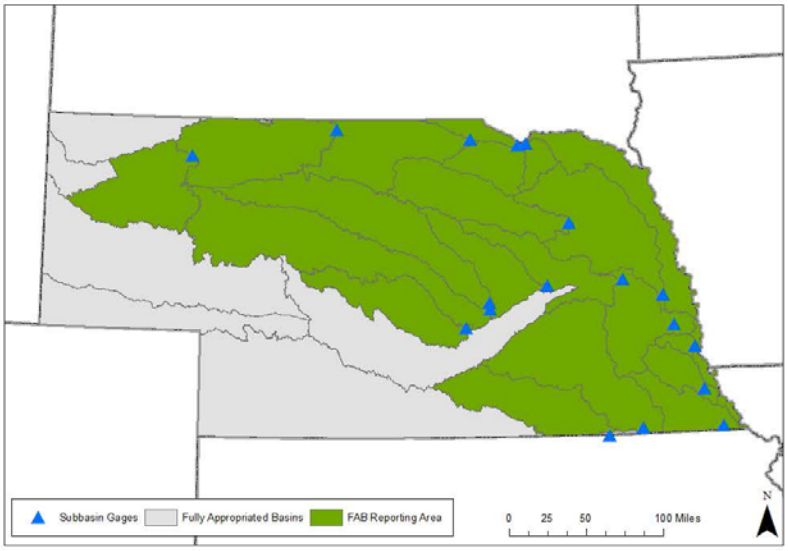


Figure 1. Subbasins to be evaluated through the Department's Annual Evaluation

4.3.1.2 Surface Water Consumptive Uses

Surface water consumptive uses are intended to reflect all direct diversions of streamflow for consumptive uses minus the portion of the diversion that returns to the stream (return flow). Return flow can occur as direct runoff (e.g., overland flow or canal spillways) or through recharge to the aquifer, eventually returning to the stream as baseflow. Surface water uses can be estimated through the use of measured diversion data combined with assumptions regarding return flow, or through the use of irrigated acreage data and assumptions regarding crop irrigation requirements and availability of streamflow (e.g. stream gage data, water administration records, etc.). The specific approach used to assess a point of diversion will rely on the best available science and data.

4.3.1.3 Groundwater Depletions

Groundwater is largely derived from recharge from precipitation and, in the absence of groundwater pumping, ultimately discharges from the aquifer as baseflow to a river or as direct evapotranspiration from the water table (typically in riparian zones). Generally speaking, over the long term, the discharge to the aquifer is equal to the aquifer recharge. Groundwater use changes this equation and reduces the amount of recharge that ultimately discharges to the stream. This difference in stream baseflow is termed "stream

depletion" and can be determined with groundwater modeling tools (analytical or numerical).

Groundwater depletions are calculated by evaluating the effects of groundwater pumping by high capacity wells (greater than 50 gallons per minute), and summarizing those impacts for each given basin, subbasin, or reach. In performing this analysis the Department relies on the best available scientific information, including groundwater models which have been reviewed by the Department.

4.3.1.4 Final Basin Water Supplies

The final step in determining the Basin Water Supply is to sum the streamflow, surface water consumptive use, and groundwater depletions for the period of record and then statistically assess this summation to determine if any trends and/or cycles exist. Cycles that are of interest are the natural dry and wet hydrologic periods that occur in the river basins across Nebraska. To ensure that any trends in data resulting from the dry/wet hydrologic cycles do not bias the analysis, two types of statistical analyses are performed to determine an appropriate, unbiased period of record for the evaluation.

The first process is the utilization of an autocovariance analysis. This process ensures that the representative period used for the evaluation includes the most recent pattern of wet and dry conditions, and that it is not reflective of other underlying trends or causal mechanisms. The autocovariance analysis of the Basin Water Supply provides a measure of self-similarity of the time-series data. In other words, it provides a measure of the time periods over which patterns tend to repeat. The resulting autocovariogram/autocorrelagram plots the coefficients, which range from -1 to 1, that represent the degree of correlation between the time-series and a time-shifted version of itself. This process aids in identification of the representative period that contains the most recent wet and dry conditions.

In order to ensure that the resulting evaluation is not biased by trends resulting from factors beyond the components of the Basin Water Supply, a trend analysis is performed. Once the representative period of record is identified, a Kendall Tau test is performed on that period of record. The Kendall Tau test, a simple non-parametric test statistic, can be used to identify statistically significant trends within a dataset by measuring concordance. This test statistic ranges from -1 to 1, testing the null hypothesis of zero association. If the Kendall Tau test statistic does not suggest the presence of an underlying trend, then the evaluation process continues, if the test suggests that a trend is present, then the representative period will be reevaluated.

4.3.2 Determination of Total Uses

The Total Use, in conjunction with the Basin Water Supply, is essential to determining the preliminary status of a basin. The following defines Total Use, and gives generalized methods for calculating each component that comprises the Total Use.

The Total Use of water within a basin, subbasin, or reach is derived from six main categories of water use: 1) consumptive water demands for hydrologically connected high capacity (greater than 50 gallons per minute) groundwater well pumping; 2) consumptive water demands for surface water uses; 3) the net water determined to be necessary to deliver streamflows to meet consumptive demands of surface water; 4) streamflow available to meet instream flow appropriations at the time the appropriation was granted (accounting for all development in place at such time the appropriation was granted); 5) instream flow demands for hydropower operations; and 6) the proportionate amount of Basin Water Supplies necessary to meet demands downstream of a given basin, subbasin, or reach. This section provides a further description of these six categories of water demands.

4.3.2.1 Demands on Water Supplies for Groundwater Consumptive Use

The consumption of hydrologically connected water supplies due to groundwater pumping is derived through evaluating high capacity (wells pumping greater than 50 gallons per minute) well development within the 10/50 area. The goal of this portion of the analysis is to identify the level of groundwater consumption associated with current levels of development within the 10/50 area. The broad categories of use evaluated as part of this analysis are: 1) irrigation; 2) municipal (not inclusive of sole source domestic wells); and 3) industrial.

Estimates of the level of consumption of water necessary to meet irrigation use are calculated through evaluating current levels of irrigated acreage development and crop distributions, and multiplying those land uses by the crop water needs for the representative period of record being analyzed. The methods used to determine irrigated acreage development, crop distributions, and crop consumption estimates rely on the best available scientific information.

The approach used to estimate municipal water use follows one of two methods. The first method (preferred when the data is available) utilizes available information on municipal groundwater pumping and subsequent return to a stream (if applicable). Thus, this method calculates a net consumption by taking the difference of the amount of water pumped and the amount of water returned through a municipal system. If no water is returned, as in the case of a full retention system, then the pumped amount is assumed to be 100 percent consumed.

The second method utilizes current population statistics and an appropriate estimate of per capita use. This method is accomplished by multiplying the current level of population by the appropriate level of per capita consumption. The appropriate level of per capita consumption is derived based on the location of the given municipality and relies on the best available scientific information.

The approach used to estimate industrial water use is based on identifying the number of high capacity industrial wells and multiplying the number of industrial sites by an estimated water use associated with typical industrial water use. The methods for

estimating typical industrial water use will rely on the best scientific information available.

To develop a final total estimate of demands on water supplies for groundwater consumptive use in the 10/50 area, the totals from these three categories of use (irrigation, municipal, and industrial) are summed.

4.3.2.2 Demands on Water Supplies for Surface Water Consumptive Use

The demands on water supplies for surface water consumptive use of hydrologically connected water supplies is derived through evaluating active points of diversion in each basin, subbasin, or reach. This portion of the analysis identifies the level of demand on water supplies by surface water consumptive use due to current levels of surface water development. The broad categories of use evaluated as part of this analysis are: 1) irrigation; 2) municipal (not inclusive of sole source domestic); and 3) industrial.

Estimates of the level of consumption of water necessary to meet irrigation use are calculated through evaluating current levels of surface water irrigated acreage development, crop distributions, and multiplying those land uses by the crop water needs for the period of record being analyzed. The methods used to determine irrigated acreage development, crop distributions, and crop consumption estimates rely on the best available scientific information.

The approach used to estimate municipal water use follows one of two methods. The first method (preferred when the data is available) utilizes available information on municipal water diversions and subsequent return to a stream (if applicable). Thus, this method calculates a net consumption by taking the difference of the amount of water diverted and the amount of water returned through a municipal system. If no water is returned, as in the case of a full retention system, then the diverted amount is assumed to be 100 percent consumed.

The second method utilizes current population statistics and an appropriate estimate of per capita use. This method is accomplished by multiplying the current level of population by the appropriate level of per capita consumption. The appropriate level of per capita consumption is derived based on the location of the given municipality and relies on the best available scientific information.

The approach used to estimate industrial water use is based on identifying the number of points of diversion and multiplying them by an estimated water use associated with typical industrial water use. The methods for estimating typical industrial water use will rely on the best scientific information available.

4.3.2.3 Demands on Water Supplies for the Net Water Determined to be Necessary to Deliver Streamflows to Meet Consumptive Uses of Surface Water

The demands on water supplies for the net water determined to be necessary to deliver streamflows to meet consumptive uses of surface water are derived through an evaluation of the conveyance structures (canals, pumps, etc.) associated with the delivery of surface water for consumptive use. In many cases, such as large unlined canals, it is important to assess this component of water demands as this is the means by which water is available for consumption. In conducting this evaluation, it is also recognized that in certain areas a portion of this demand is met by streamflows that are returned into the stream from upstream uses and those streamflows are not returned to the stream within the same time period (i.e., June through August or September through May) or within the same year. The specific value that will be used to represent this component of demands will be based on the best available science.

4.3.2.4 Demands on Water Supplies for Instream Flows

Instream flow use is determined in areas where existing instream flow appropriations are currently permitted. The evaluation of instream flows is slightly different than other water uses in that an additional step must be taken to assess the full impacts of the level of development at the time the appropriation was granted. *Nebraska Revised Statute* § 46-713 (3)(a) states that subbasins shall be deemed fully appropriated when:

> "…….***then-current*** *uses of hydrologically connected surface water and ground water in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause (a) the surface water supply to be insufficient to sustain over the long term the beneficial or useful purposes for which existing natural-flow or storage appropriations were granted and the beneficial or useful purposes for which,* ***at the time of approval****, any existing instream appropriation was granted… … .".*

Instream flows are incorporated into the analysis for those areas where surface water appropriations are currently in place. Instream flows represent a "non-consumptive" category of water demand, thus water supplies available to meet instream needs may also be used to meet other non-consumptive demands such as hydropower or induced recharge. Instream flow demands are incorporated into the analysis in a manner that takes into account the level of development (both surface water and groundwater) that was in place at the time an appropriation was granted.

Instream flow demands are represented through a three-step process. The first step consists of adding the total groundwater depletions to the daily streamflow values at the point of the appropriation for the representative period. The second step consists of subtracting the consumption associated with levels of groundwater development in place at the time of the appropriation from the daily flows created in step 1 (ensuring that all values less than zero, are set to zero). The third and final step is to truncate the daily

flows to those amounts of water appropriated on each day. An example of this process is provided below.

Step1: Streamflow = 1,800 cubic feet per second (cfs)
Groundwater depletion = 200 cfs
Adjusted streamflow = 1,800 + 200 = 2,000 cfs

Step 2: Adjusted streamflows resulting from step one = 2,000 cfs
Consumption associated with groundwater development in place at the time of appropriation = 500 cfs
Step 2 adjusted streamflows = 2,000 -500 = 1,500 cfs

Step 3: Rate of instream flow provided for in the appropriation = 1,800 cfs
Final instream flow demand on that day = 1,500 cfs

If the rate of appropriated instream flow would have been less than the 1,500 cfs value (i.e., 1,000 cfs) in the example above, then the final instream flow demand on that day would have been truncated at that value (i.e, 1,000 cfs).

4.3.2.5 Demands on Water Supplies for Hydropower

Demands on water supplies to support hydropower water uses are represented in the analysis as a non-consumptive use. As mentioned in the previous section (Demands on Water Supplies for Instream Flows), water supplies available to meet non-consumptive uses are analyzed to ensure that water demands are not unnecessarily being duplicated. This analysis is performed through a comparison of both hydropower demands and instream flow demands where they coexist.

Hydropower demands are represented by evaluating the water supplies that were diverted on a daily basis through the representative period, and the groundwater depletions to those daily values when the diversion was operational and the full capacity of the diversion was not realized. An example of this process is provided below.

Step1: Streamflow = 1,800 cubic feet per second (cfs)
Groundwater depletion = 200 cfs
Adjusted streamflow = 1,800 + 200 = 2,000 cfs

Step 2: Daily rate of diversion for hydropower = 1,800 cfs
Final hydropower demand on that day = 2,000 cfs

If the rate of diversion for hydropower were equal to zero then that days demand is set equal to zero. Additionally, if the appropriated rate of diversion for hydropower would have been less than the 2,000 cfs value (i.e., 1,000 cfs) in the example above, then the final hydropower demand on that day would have been truncated at that value (i.e, 1,000 cfs).

4.3.2.6 Demands on Water Supplies for Meeting Downstream Water Needs

A portion of Basin Water Supplies are necessary to meet downstream water demands. To recognize and account for this in the evaluation, that portion of Basin Water Supply at each gage required to meet downstream water uses is estimated and applied at the upstream gage. To facilitate the allocation of downstream demands, only main-stem channel water demands are utilized. Non-consumptive and consumptive uses are considered separately, as non-consumptive uses are typically available to meet multiple downstream water demands.

Downstream non-consumptive use demands are computed as the ratio of Basin Water Supplies at the evaluation point (basin, subbasin, or reach outlet gage) to all of the other downstream evaluation points. This calculation is necessary to determine what percentage of flow in the basin, subbasin, or reach contributes to subsequent downstream basins, subbasins, or reaches. Examples of this process are outlined in Section 9.7.4 of the "Fully Appropriated Evaluation Methodology Development" Technical Memorandum published by HDR Engineering, Inc. and The Flatwater Group[3]. The process is repeated at all downstream evaluation points. The percentages identified at each evaluation point are multiplied by each non-consumptive use demand at that evaluation point. The non-consumptive use demand represents the amount of flow that downstream basins, subbasins, or reaches could reasonably expect to receive based on the upstream contribution. Therefore, the upstream basin is only assigned its percentage of the downstream non-consumptive use demand and no more. The next step in this process is to perform any necessary reductions in non-consumptive water demands to account for other non-consumptive uses already represented in the demands. Further discussion of this process is outlined in the Technical Memorandum (HDR, 37-41). It is important to note that this amount is not cumulative. If the upstream basin provides its portion to meet the largest downstream non-consumptive use demand, sufficient flow would be provided to meet all of the downstream non-consumptive use demands.

In contrast to downstream non-consumptive use demand, the calculation of downstream consumptive use demand is cumulative. The upstream basin, subbasin, or reach is assigned a portion of the downstream water demands on the main-stem channel, or in the case of downstream groundwater demands, that portion within the 10/50 area of the main-stem channel. The upstream basin would not be assigned the entire downstream water demand. Rather, the upstream subbasin or reach is only assigned the percentage of downstream water demands equivalent to its contribution to the entire basin's Basin Water Supply.

4.3.3 Determination of Balance between Current Water Supplies and Uses

Once the Basin Water Supply and the Total Use are determined, the comparison of the two components can be completed. To recognize the impact that timing has on the

[3] HDR Engineering, Inc. and The Flatwater Group. "Fully Appropriated Evaluation Methodology Development." November 2011.
http://dnr.ne.gov/IWM/Reports/FinalFullyAppropriatedEvaluationRefinementsTM12072011.pdf

usefulness of a water supply to meet a beneficial water use, the comparison is done for two time periods in a given year: September 1 through May 31, and June 1 through August 31. Additionally, statute requires that the comparison be done to evaluate both the near term and long term balance. The only difference between the near-term and long-term analysis is that consumptive water demands for high capacity (greater than 50 gallons per minute) groundwater well pumping are replaced with the level of groundwater depletion associated with these uses over the representative period.

4.3.3.1 Near-Term Balance

The determination of the balance between current water supplies and uses in the near term focuses on a comparison of Basin Water Supplies and Current Uses over the representative period. The comparison will yield results which describe the amount, location, and timing of the surplus and deficit in water supply. An evaluation of the water supply surplus and deficit results will be conducted to determine the fully appropriated status of each basin, subbasin, or reach. Current Uses are determined by summing: 1) the rate of groundwater depletions; 2) consumptive water demands for surface water uses; 3) the net water determined to be necessary to deliver streamflows to meet consumptive demands of surface water; 4) streamflow available to meet instream flow appropriations at the time the appropriation was granted (accounting for all development in place at such time the appropriation was granted); 5) instream flow demands for hydropower operations; and 6) the proportionate amount of Basin Water Supplies necessary to meet demands downstream of a given basin, subbasin, or reach. Should the volume of deficits exceed the supplies then a preliminary determination of fully appropriated will be reached.

4.3.3.2 Long-Term Balance

The determination of the balance between current water supplies and uses in the long term focuses on the comparison of surplus and deficits of Basin Water Supplies and Total Use over the representative period. Total Use is determined by summing: 1) consumptive water demands for high capacity (greater than 50 gallons per minute) groundwater well pumping; 2) consumptive water demands for surface water uses; 3) the net water determined to be necessary to deliver streamflows to meet consumptive demands of surface water; 4) streamflow available to meet instream flow appropriations at the time the appropriation was granted (accounting for all development in place at such time the appropriation was granted); 5) instream flow demands for hydropower operations; and 6) the proportionate amount of Basin Water Supplies necessary to meet demands downstream of a given basin, subbasin, or reach. This analysis is refined to evaluate this balance over two portions of the year: September 1 through May 31, and June 1 through August 31. Should the volume of deficits exceed the supplies then a preliminary determination of fully appropriated will be reached.

4.3.4 Evaluation of Compliance with Compacts, Decrees, Agreements, and State and Federal Laws

To evaluate compliance with state and federal law, it was determined that currently, only the state and federal laws prohibiting the taking of threatened and endangered species could raise compliance issues that would trigger condition (c) of 457 NAC 24.001. The federal Endangered Species Act (ESA), 16 U.S.C. §§ 1530 *et seq.*, prohibits the taking of any federally listed threatened or endangered species of animal by the actual killing or harming of an individual member of the species (16 U.S.C. § 1532), or by the significant modification or degradation of designated critical habitat where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). The state Nongame and Endangered Species Conservation Act (NNESCA), *Neb. Rev. Stat.* §§ 37-801 *et seq.*, also prohibits the actual killing or harming of an individual member of a listed species and the destruction or modification of designated critical habitat. It was concluded that any reductions in flow that may occur as a result of not determining a basin, subbasin, or reach to be fully appropriated will not cause noncompliance with either federal or state law at this time in any of the basins evaluated.

For the areas of the state not currently designated as fully or overappropriated, only one basin is subject to an interstate compact, decree, or agreement, specifically, the Blue River Basin. The State of Nebraska is a signatory member of the Kansas – Nebraska Big Blue River Compact (Compact). The purposes of the Compact are to promote interstate comity, to achieve an equitable apportionment of the waters of the Big Blue River Basin, to encourage continuation of the active pollution-abatement programs in each of the two states, and to seek further reduction in pollution of the waters of the Big Blue River Basin. As long as Nebraska administers surface and groundwater in compliance with the Compact, decreased streamflow, in and of itself, will not cause Nebraska to be in noncompliance with the Compact.

4.4 Evaluating the Impacts of Predicted Future Development in a Basin

In addition to the Department's evaluation of current levels of development, the Department is required to assess how the preliminary conclusion would change if no additional legal constraints were imposed on future development of hydrologically connected water supplies. The results of the evaluation of future development will not be used on their own to reach a preliminary determination that a basin, subbasin, or reach is fully appropriated.

The Department is required by § 46-713 to project the impact of reasonable future development within a basin on the potential for a preliminary designation of fully appropriated. The results of this analysis alone cannot cause a basin to be declared fully appropriated. The analysis does, however, provide an estimate of the effects of current development trends on the basin's future balance between water supplies and uses. The steps necessary to calculate the impacts of future development on the preliminary determination parallel those used to assess the balance between Basin Water Supplies and

Total Uses (described above in Section 4.3.3.2). The only difference is that the Department will utilize the best available science and data to determine an appropriate method for projecting future development over the next twenty-five years.

APPENDIX D:
Public Meeting Notifications

Dave Heineman
Governor

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
Brian P. Dunnigan, P.E.
Director

April 18, 2013

IN REPLY TO:

TO: Interested Parties

FROM: Jesse Bradley, Integrated Water Management Division Head
Department of Natural Resources

SUBJECT: Public Meetings on the Draft Revised Rules Title 457, Chapter 24, for the Department of Natural Resources

As stated in our previous letter, sent on April 8, 2013, the Nebraska Department of Natural Resources will hold a series of public comment meetings to provide an open forum regarding the Department's fully appropriated determination rules changes (see http://dnr.ne.gov for details). The meetings will provide an explanation of the intent of the new rule changes including a question and answer session. The dates and times for each meeting are listed below.

Date	Time	Location
Monday, May 13, 2013	9:00 a.m.-11:00 a.m.	Norfolk - Holiday Inn Express Meeting Room B 920 S. 20th Street
Monday, May 13, 2013	4:00 p.m.-6:00 p.m.	Valentine - Niobrara River Lodge Minnechaduza Room 803 E. Hwy 20
Tuesday, May 14, 2013	8:00 a.m.-10:00 a.m.	Scottsbluff - Hampton Inn & Suites Sandstone Room 301 W. Hwy 26
Tuesday, May 14, 2013	4:30 p.m.-6:30 p.m.	Kearney - Holiday Inn Hotel and Convention Center - Room D 110 Second Avenue
Wednesday, May 15, 2013	9:00 a.m.-11:00 a.m.	Beatrice - Holiday Inn Express Lincoln-Omaha Room 4005 N. 6th Street
Thursday, May 16, 2013	1:30 p.m.-3:30 p.m.	Lincoln - Nebraska State Office Building Lower Level F 301 Centennial Mall South

Individuals unable to attend these meetings can provide comments on the Department's website: http://dnr.ne.gov/FabRule/Default.aspx. Thank you for your time and interest in these modifications.

301 Centennial Mall South, 4th Floor • P.O. Box 94676 • Lincoln, Nebraska 68509-4676 • Phone (402) 471-2363 • Telefax (402) 471-2900

APPENDIX E:
Overview of New Rules for Determining Fully appropriated Basins

Overview of New Rules for Determining Fully Appropriated Basins

May 2013

Jesse Bradley, *Nebraska Department of Natural Resources, Integrated Management Division Head*

Outline

- Why the rules change?
- Timeline for Development of the New Rules
- Concepts Behind the New Rules
  - (Preliminary Determination/Final Determination)
- What Do the New Rules Mean to the Overappropriated Basin and Republican Basin
- Timeline for Moving Forward

Why the Rules Change?

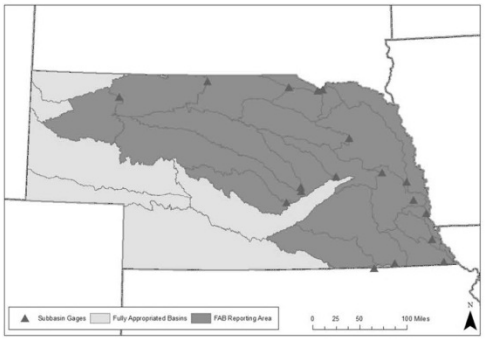
- Necessity to Determine the Difference between Fully and Overappropriated (Upper Platte River Basin)
- Legal Challenge and Supreme Court Ruling
- Seamless Transition to Water Planning (Proactive Understanding)

Timeline

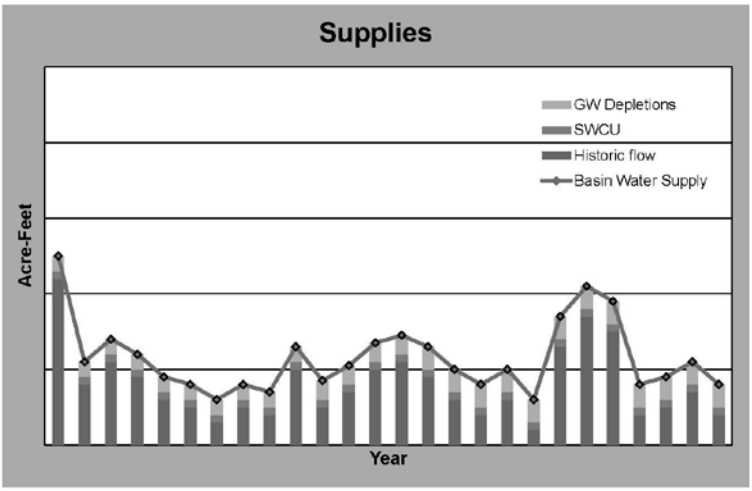
- Platte Basin NRDs and Department initiate methodology study (2009)
- Release of Literature Review and Initial Recommendations (Spring 2010)
- Stakeholder Meeting (May 2011)
- Initial Technical Report (Fall 2011)
- Final Stakeholder Meetings (Fall 2012)
- Release of Final Report (April 2013)

Rules Concepts

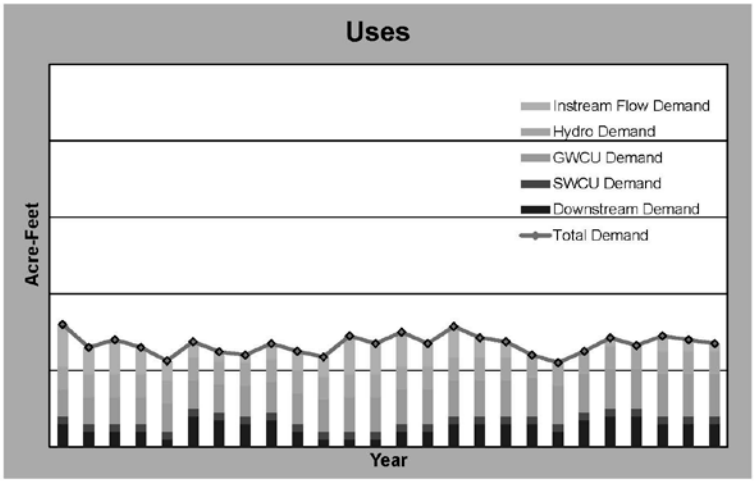
- Basin Water Supplies
  - Streamflow (recharge/runoff)
  - Groundwater Depletions
  - Surface Water Consumption
- Total Water Uses
  - Groundwater Consumption
  - Surface Water Consumption
  - Instream Flow Demands
  - Hydropower Demands
  - Downstream Water Demands



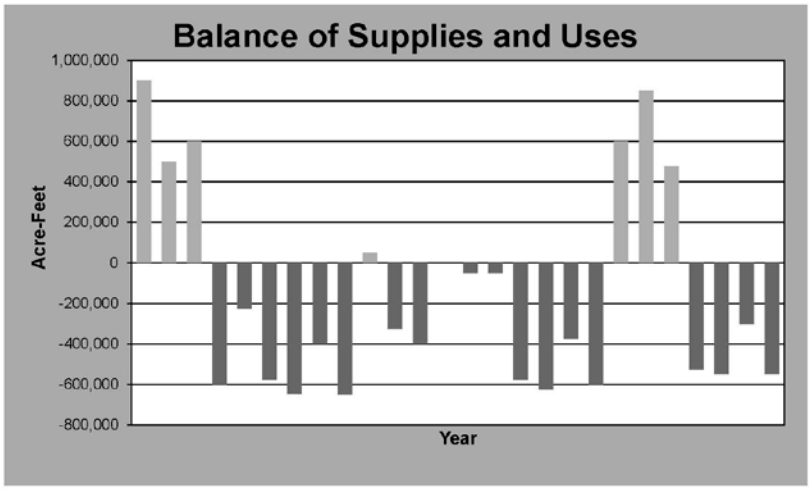
Rules Concepts



Rules Concepts



Rules Concepts



Rules Concepts

- Department conducts preliminary determination (Rule 001.01 A-D)
- Hearings held on determination to assess if new relevant information has been identified
- Reviews if planning processes meet requirements (Rule 001.02 B-C)
- Final determination then made (Rule 001.02 A)

Overappropriated Basin and Republican Basin

- Rules will be used by DNR and NRDs to complete OA/FA assessment (2014-2015)
- Results of this assessment will be made available to the basin stakeholders
- DNR and NRDs will set second increment goals and objectives
- Rules will not impact Republican Basin

Timeline for Moving Forward

- Draft Rules and Methods Released (April 2013)
- Public Q&A sessions on Draft Rules (May 2013)
- Department Review of Public Comments and Modifications to the Draft Rules (June 2013)
- Public Hearings (Summer 2013)
- Annual Evaluation (December 2013)

http://dnr.ne.gov/website/MainPage.aspx

Thank you

Questions?

APPENDIX F:
Summary of Narrative Presentation

The purpose of this presentation was to identify reasons for the rule change, outline the timeline for the development of the new rules, describe the concepts behind the new rules, interpret the impact of the new rules on the over appropriated portion of the Platte River Basin and the Republican basin, and define the timeline moving forward.

Three main factors motivated the need for the rules change: 1) the necessity to determine the difference between fully appropriated and over appropriated, 2) a legal challenge to a fully appropriated designation and the ruling of the Nebraska Supreme Court reversing this designation, and 3) the need for a seamless transition to water planning. The DNR is required to identify the difference between over appropriated and fully appropriated in the over appropriated basin of the Platte River Basin; the DNR, working with NRDs in this region, completed plans for a technical analysis in 2009. While analyzing the current rules and the methods for the technical analysis, it was determined the current rules did not align with the current integrated management plans (IMPs) and were focused on administration of junior water use instead of analyzing the conditions in the basin. The basin NRDs developed a grant proposal, hired a consultant, and began developing the new rules. A legal challenge to a designation in the Niobrara basin was challenged and resulted in the Nebraska Supreme Court reversing the designation. The court assessed the rules of the DNR were ambiguous in administration of water rights. In addition, the change in rules should provide for an easier transition between the annual evaluation and the integrated management planning period, especially as NRDs begin developing and adopting voluntary IMPs.

Work on the new rules began in 2009 when the first IMPs were passed in the Platte River Basin and the Platte Basin NRDs and the DNR initiated a methodology study. The DNR hired a consultant to research the methodology and rules used by other states to do similar evaluations and provide recommendations; in the spring of 2010, the consultants released their literature review. Work with the consultant and NRDs continued as these recommendations were tested in the Upper Niobrara White; the Upper Niobrara White was chosen as it is a simpler water system with only one large reservoir serving one irrigation district, and minimal groundwater and canal uses. These tests led to a more sophisticated conceptual approach and further testing in the Lower Platte Basin - a more complex water system incorporating instream water uses for hydropower and instream flow appropriations – to determine how to incorporate increased water demands into the conceptual framework. These tests culminated in a stakeholder meeting in the May 2011; comments and suggestions from this meeting were incorporated into the rules and technical analysis. Following the stakeholder meeting, the test was expanded to the over appropriated basin of the Platte, the most complex water system. In the fall of 2012, final stakeholder meetings were held and the consultants released their final report; in April 2013 the draft rules were released.

The rules concepts appraises water supplies and water uses. Basin water supply is the sum of stream flow, surface water consumption, and groundwater depletions; total water uses are comprised of groundwater consumption, surface water consumption, instream flow demands,

hydropower demands, water for conveying surface water consumption and downstream water demands (non-consumptive water demands were not calculated twice). Using statistical analysis, a representative period is determined to provide the best timeframe for analysis while drawing out major trends in water supply and capturing the cyclical nature of the wet and dry periods. Water supply and total water uses were compared against each other to determine the balance of water supply and use; if the water supply was positively balanced (a surplus of water), the basin is determined to not be fully appropriated, if the water supply was negatively balanced (a deficit of water), the basin is preliminarily determined to be fully appropriated. The data is aggregated for two periods throughout the year: the season between June and August and the season between September and May.

Section 001.01 A-D of the rules outlines the technical analysis approach; section 001.002 A-C dictates that the DNR will research available and active planning processes. A120 day period between a preliminary designation and final designation is outlined in statute in which time public hearings and review of the results occurs. Additionally, the new rules incorporate the addition of voluntary IMPs to potentially alleviate the need for a final fully appropriated designation if certain criteria are met.

The over appropriated basin and the Republican basin are not evaluated annually; the assessment for the over appropriated basin will have to follow the new rules and will be done in conjunction with the NRDs, likely in 2014 or 2015 prior to setting second increment goals and objectives in 2019. Results of this assessment will be made available to stakeholders in the basin. A basin-wide meeting is held in the basin annually and focuses on current management activities. More information can be found on the DNR's website. Goals and objectives for the next increment will be reached collaboratively between the DNR and NRDs. The new rules will not affect the Republican River Basin as that was designated by legislative statute.

In early April, the draft rules and methods were released; in May 2013, public question and answer sessions were held in Norfolk, Valentine, Scottsbluff, Kearney, Beatrice, and Lincoln. Public comments will be received until June 7, 2013 at which point the DNR will review all comments and make necessary amendments to the draft rules and methods. In late summer of 2013, formal public hearings will be held to determine if the rules should be adopted. In December 2013, the annual evaluation will be completed using the new rules, if adopted.

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