



WATER ACTION PLAN UPDATE REPORT



April 2021

First Increment Progress, 2007-2019



PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

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FINAL REPORT



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Executive Summary

Water Plan goals for the 13-year First Increment (2007-2019) of the Platte River Recovery Implementation Program (PRRIP or Program) were as follows:

- First Increment water objective: Provide water capable of reducing shortages to [U.S. Fish and Wildlife Service] target flows by an average of 130,000-150,000 acre-feet per year.
- Milestone 4: The Reconnaissance-Level Water Action Plan, as may be amended by the Governance Committee, will be implemented and capable of providing at least an average of 50,000 acre-feet per year of shortage reduction to target flows, or for other Program purposes, by no later than the end of the First Increment.

These goals were not achieved in full, necessitating a First Increment Extension (2020-2032), but significant progress was made by the end of 2019. The three initial water projects—Tamarack I groundwater recharge in Colorado, the Pathfinder Modification Project in Wyoming, and the Lake McConaughy Environmental Account (EA) in Nebraska—were collectively credited with providing an average of 80,000 acre-feet per year (AFY) towards the First Increment water objective at the outset of the Program.

For purposes of documenting the history of Water Action Plan (WAP) progress, it was useful to divide the First Increment into five phases, periods of two or three years that were dominated by specific activities (e.g., feasibility studies) or project pursuits (e.g., J-2 Regulating Reservoirs). These phases are illustrated in **Figure ES-1**. In general, work on multiple projects was proceeding simultaneously, but a thorough review of Water Advisory Committee (WAC) and Governance Committee (GC) meeting minutes clearly showed how the Program’s highest-priority Water Plan activities evolved over time. Throughout the First Increment, Program staff and stakeholders learned valuable lessons from numerous project pursuits—some that were successful and others that were not—that continue to guide water policies now and into the future.

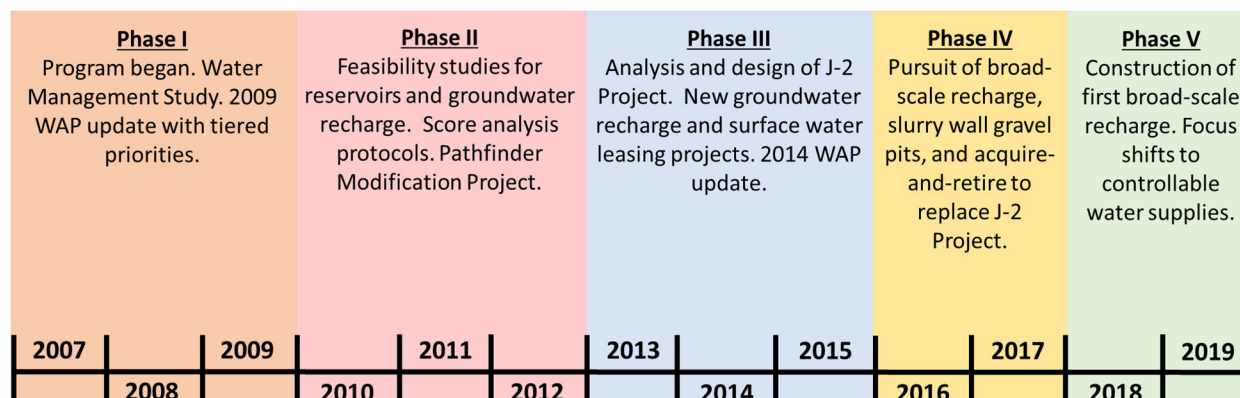


Figure ES-1. Phases of Water Action Plan implementation during the Program’s First Increment.



34 **Table ES-1** shows that 11 individual WAP projects with approved or estimated scores that
 35 collectively exceed 34,000 AFY were implemented between 2007 and 2019. Most of these
 36 projects were characterized as either Nebraska groundwater recharge (including the Cook
 37 recapture well) or Nebraska water leasing. In addition, a small volume of Net Controllable
 38 Conserved Water (NCCW) is credited to the Lake McConaughy Environmental Account (EA)
 39 each year at no cost to the Program, and Wyoming water is leased from the Municipal Account
 40 in Pathfinder Reservoir. Overall, the cumulative score from the three initial water projects and
 41 the 11 active WAP projects was estimated to be 114,120 AFY at the end of the First Increment.
 42

43 **Table ES-1. WAP Projects Implemented During the PRRIP First Increment (2007-2019).**

Project	Project Type	Year of First Operations	Score [AFY]	Score Status
NCCW (No Cost)	Other	2007	260	Approved
Phelps County Canal	Nebraska groundwater recharge	2011	2,700	Approved
Pathfinder Municipal Account Lease	Other	2012	6,350	Approved
CPNRD Canals	Nebraska groundwater recharge	2013	600	Estimated
CPNRD Canals	Nebraska water leasing	2015	10,800	Estimated
Elwood Reservoir	Nebraska groundwater recharge	2015	2,800	Approved
NPPD Canals	Nebraska groundwater recharge	2015	1,800	Estimated
CNPPID Irrigators	Nebraska water leasing	2016	1,900	Approved
Cook Recapture Well	Nebraska groundwater recharge	2016	160	Approved
NPPD Canals	Nebraska water leasing	2019	2,750	Estimated
Broad-Scale Recharge	Nebraska groundwater recharge	2020*	4,000	Estimated
WAP Projects (6) Approved Score =			14,170 AFY	
WAP Projects (5) Estimated Score =			19,950 AFY	
WAP Projects (11) Total Score =			34,120 AFY	

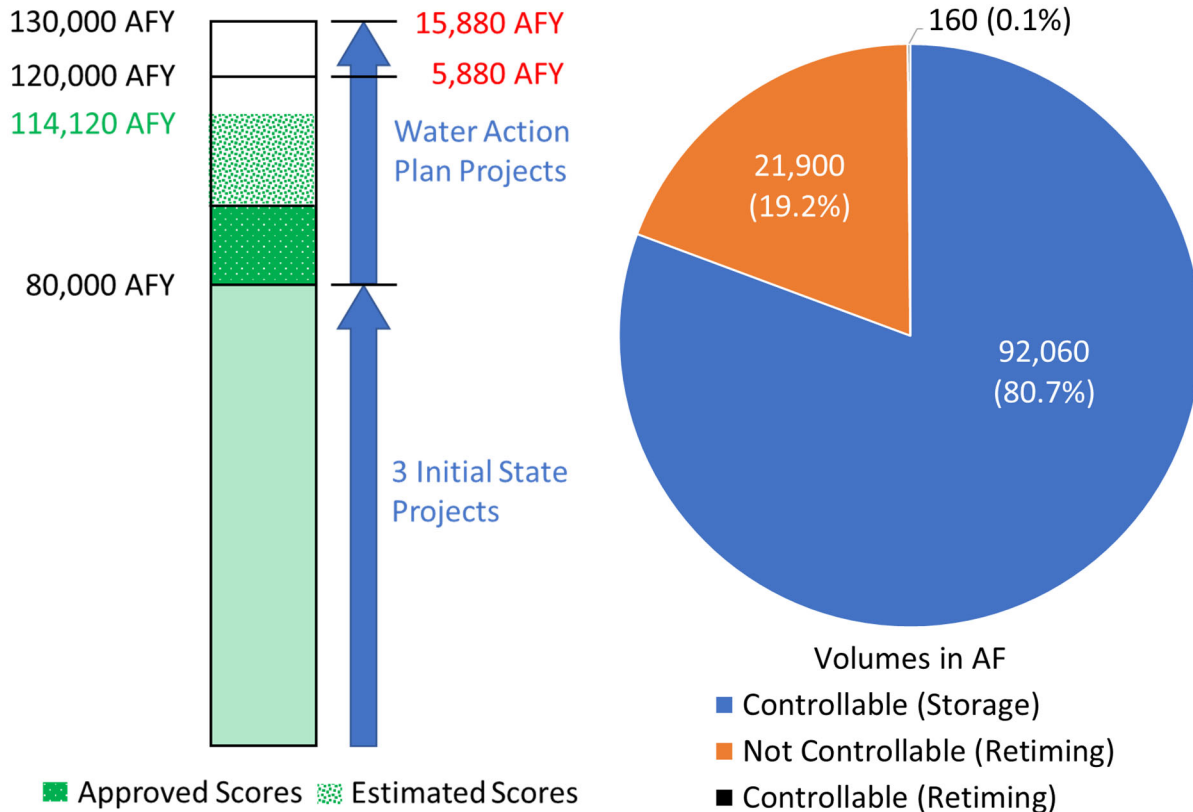
44 * Construction of the Cottonwood Ranch broad-scale recharge project was completed in October 2019, and test fill
 45 operations occurred July-September 2020.
 46

47 For the First Increment Extension, the water goals were slightly modified to reflect both the
 48 Program’s budgetary constraints and the more complicated than expected reality of securing the
 49 necessary water supplies. The Program remains committed to achieving average annual shortage
 50 reductions of 130,000 AFY. However, the course of action will be to reach 120,000 AFY as
 51 quickly as possible during the First Increment Extension, then conduct the science necessary to
 52 determine if the next 10,000 AFY is needed to achieve target species management objectives.
 53

54 The left side of **Figure ES-2** illustrates the modified water objective and progress made through
 55 2019. The right side of the figure reframes the 114,120 AFY cumulative score in terms of
 56 whether Program water projects are controllable or not controllable. More than 80 percent of
 57 Program water is controllable, nearly all of which ends up in the Lake McConaughy EA. These
 58 supplies will be essential to the success of water-related science experiments and Adaptive



59 Management Plan activities during the First Increment Extension. Recharge projects account for
 60 all of the water that is not controllable.
 61



62
 63 **Figure ES-2. (Left) Modified First Increment Water Objective and Overall Progress**
 64 **through 2019. (Right) Controllable and Not Controllable Program Water Supplies.**
 65

66 Just under 6,000 AFY is still needed to reach 120,000 AFY, and prospects are good for the
 67 Program to reach this level of deficit reduction between 2022 and 2025. Three potential future
 68 WAP projects constitute the most likely path forward:
 69

- 70 • Recapture wells. Accretions to the Platte River from the Program’s groundwater
 71 recharge projects are expected to occur as continuous low flow rate contributions to
 72 baseflow over periods of decades. Recapture wells can be used to accelerate these
 73 return flows with controlled operations timed to coincide with target flow shortages.
 74 The Program is already developing a pilot-scale network of seven recapture wells that
 75 will pump water recharged through the Phelps County Canal, Elwood Reservoir, and the
 76 Cottonwood Ranch broad-scale recharge project. This pilot project is estimated to have
 77 a score of about 1,500 AFY; future expansions of the recapture well network could
 78 achieve a total score of up to **8,000 AFY**.
- 79 • North Platte irrigator/irrigation district lease(s). Glendo Reservoir holds 25,000 AF of
 80 storage water allocated for irrigation in the North Platte River basin of western



81 Nebraska. The 2001 North Platte River Settlement further allows this water to be (a)
82 used for fish and wildlife purposes anywhere in the Platte River basin downstream of
83 Glendo Reservoir and (b) administered and protected as storage water until it is used for
84 such purposes. The Program is pursuing a lease agreement with an irrigation district
85 that has a long-term contract with the U.S. Bureau of Reclamation for 3,000 AF of the
86 Glendo storage water. Leased water would be transferred downstream to the Lake
87 McConaughy EA each year and result in an estimated score of about **2,500 AFY**.
88 Agreements with other North Platte irrigation districts could bring additional
89 controllable water into the Lake McConaughy EA.

- 90 • CNPPID storage lease. The Program may also be able to lease storage water from
91 CNPPID in variable amounts up to 10,586 AF each year depending on the October 1
92 total storage volume in Lake McConaughy. Based on 1947-1994 modeled storage data
93 and proposed lease terms from 2018, the estimated score for this project is about **6,600**
94 **AFY**.

95
96 With combined scores up to and possibly exceeding 17,100 AFY, these three potential future
97 WAP projects provide the Program with a great deal of flexibility on the way to achieving its
98 water objectives. Either recapture wells or the CNPPID storage lease could individually fill the
99 remaining gap to reach 120,000 AFY if developed to the fullest extent. Smaller versions of one
100 or both of those projects together with leases from North Platte irrigation district(s) could serve
101 the same purpose. Furthermore, combinations of these projects could provide a buffer should
102 any of the 11 active WAP projects be terminated or if scores that are eventually approved for
103 certain projects are less than current estimates. If the science indicates a need for the last 10,000
104 AFY, these three projects also represent a way to reach 130,000 AFY.



105 1 Introduction

106 The Platte River Recovery Implementation Program (PRRIP or Program) was established to
107 improve and maintain associated habitats for threatened and endangered species in the central
108 Platte River, including the whooping crane, piping plover, interior least tern, and pallid sturgeon.
109 The Program set out to accomplish a combination of land, water, and science-related objectives
110 during a 13-year First Increment (2007-2019). As stated in the Program Document¹ with regard
111 to water:

112
113 The Program’s First Increment water objective is to provide water capable of reducing
114 shortages to [U.S. Fish and Wildlife Service] target flows by an average of 130,000-
115 150,000 acre-feet per year.

116
117 Three initial Program water projects—Tamarack I groundwater recharge in Colorado, the
118 Pathfinder Modification Project² in Wyoming, and the Lake McConaughy Environmental
119 Account (EA)³ in Nebraska—were credited with providing an average of 80,000 acre-feet per
120 year (AFY) towards the First Increment water objective. Milestone 4 in the Program’s
121 Milestones Document⁴ specifies the means by which the balance of the First Increment water
122 objective is to be achieved:

123
124 The [2000] Reconnaissance-Level Water Action Plan,⁵ as may be amended by the
125 Governance Committee, will be implemented and capable of providing at least an
126 average of 50,000 acre-feet per year of shortage reduction to target flows, or for other
127 Program purposes, by no later than the end of the First Increment.

128
129 Relative to the overall First Increment water objective, the projects that make up the Water
130 Action Plan (WAP) are to provide average annual shortage reductions of 50,000-70,000 AFY.

131
132 Additionally, the Milestones Document identifies seven steps that “are necessary to implement
133 the Water Plan and are needed to successfully complete Milestone 4.” An October 2019 memo
134 (**Appendix A**) provides a detailed status update on each of those steps at the end of the First
135 Increment. Milestone Step 4.4 states:

136
137 Recognizing that the initial Reconnaissance-Level Water Action Plan...is based on
138 reconnaissance-level project evaluations, the Governance Committee will complete

¹ Final Platte River Recovery Implementation Program, Section III.E.1.a. October 24, 2006.

² The Pathfinder Modification Project reclaimed 53,493 AF of storage capacity lost to sedimentation over a century of reservoir operations. Of that volume, 33,493 AF was allocated as the Pathfinder Environmental Account (EA), and the remaining 20,000 AF was dedicated as the Wyoming Account (aka Pathfinder Municipal Account). Pathfinder EA water is provided as part of Wyoming’s contribution to the Program, and the Municipal Account water is leased by the Program as a Water Action Plan project.

³ The Lake McConaughy EA has a maximum storage capacity of 200,000 AF. Ten percent (10%) of Storable Natural Inflows (SNI) during the non-irrigation season (October-April) are credited to the EA, up to an annual limit of 100,000 AF. Additional water credited to the Lake McConaughy EA includes the water released from the Pathfinder EA and Municipal Account as well as the annual yields from several surface water-related Water Action Plan projects.

⁴ Program Document, Attachment 2. December 7, 2005.

⁵ Program Document, Attachment 5, Section 6. September 14, 2000.



139 feasibility studies on proposed project and develop a Water Action Plan, if necessary, by
140 the end of Year 3 of the First Increment.
141

142 This step was satisfied by development of the 2009 WAP Update⁶ which organized the water
143 project concepts from the 2000 Reconnaissance-Level WAP into tiers in order “to identify a
144 general sequencing of projects to help focus the WAP related efforts.” The 2009 WAP Update
145 coincided with the initiation of pre-feasibility studies for Central Platte regulating reservoirs and
146 Nebraska groundwater recharge. Project evaluations at this time began incorporating
147 consideration of the potential to supplement short-duration high flow (SDHF) releases in
148 addition to the capacity of a project to reduce target flow shortages. Milestone Step 4.5 states:
149

150 This Water Action Plan, as may be amended by the Governance Committee, will be
151 capable of providing at least an average of 25,000 acre-feet per year of shortage reduction
152 to target flows, or for other Program purposes, by the end of Year 8 of the First
153 Increment.
154

155 This step was fulfilled as documented in the 2014 WAP Update,⁷ which reported combined
156 scores of three WAP projects⁸ totaling 37,300 AFY of target flow shortage reduction. The 2014
157 WAP Update further designated WAP projects as active, future, or inactive based on “additional
158 assessment subsequent to the 2009 WAP Update” and defined those terms as follows:
159

- 160 • Active projects were those “considered either currently implemented and operational or
161 projects the Program has commenced funding for implementation.”
- 162 • Future projects were those “scheduled for feasibility studies in the latter years of the First
163 Increment from 2015 through 2019.”
- 164 • Inactive projects were those that were “conceptually and/or financially evaluated for
165 feasibility; however the Program decided not to pursue implementation of these projects
166 during the First Increment.”
167

168 The J-2 Regulating Reservoirs Project (J-2 Project), which had been the primary focus of WAP-
169 related funding and activity for several years, began to collapse in late 2015 due to cost and other
170 factors, and within a year the Program’s Governance Committee (GC) placed the project on hold.
171 This effectively nullified a shortage reduction credit (project score) that represented more than
172 60 percent of the total required under Milestone 4. The Program started to pursue a group of
173 alternative water project concepts that were not part of any previous iteration of the WAP, but it
174 was soon evident that it would not be possible to meet the requirements of Milestone 4 and the
175 First Increment water objective by the end of 2019.
176

⁶ 2009 Water Action Plan Update. Prepared by the Platte River Recovery Implementation Program Office of the Executive Director and the Water Advisory Committee. Final Approval. February 23, 2010.

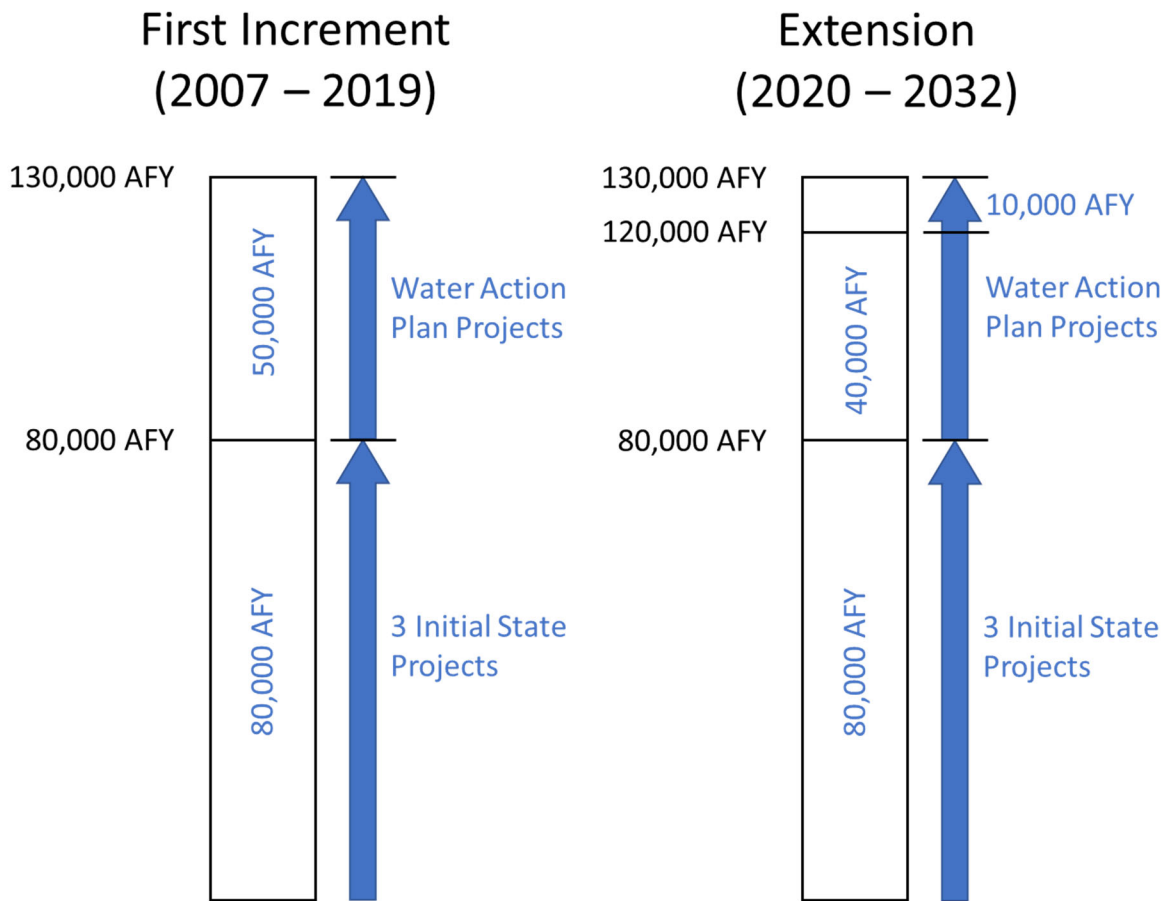
⁷ 2014 Water Action Plan Project Update: Active, Future & Inactive WAP Projects. Prepared by Executive Director’s Office staff of Platte River Recovery Implementation Program. May 22, 2015.

⁸ J-2 Regulating Reservoirs (30,600 AFY), Phelps County Canal groundwater recharge (2,700 AFY), and Pathfinder Municipal Account lease (4,000 AFY).



177 In response, GC approved a First Increment Extension Proposal in November 2016. This was
 178 followed by an Addendum to the Program Document⁹ in June 2017, which explicitly stated that
 179 “the primary purpose of this [First Increment] Extension is to fulfill the Program’s obligations
 180 under the Water Action Plan.” The commitment to achieving a minimum shortage reduction of
 181 130,000 AFY was maintained for the First Increment Extension,¹⁰ but given the status of
 182 Program water projects at the time and in recognition of the Program’s financial constraints, the
 183 terms of that objective were qualified as stated below and illustrated in **Figure 1**:

184
 185 The Program will invest the resources available to achieve at least 120,000 acre-feet in
 186 annual reductions to target flow shortages as quickly as possible during the [First
 187 Increment] Extension and will also invest in the science necessary to determine if the
 188 additional 10,000 acre-feet is justified.
 189



190
 191 **Figure 1. Comparative illustration of the First Increment and Extension approaches to the**
 192 **Program’s water objective.**

⁹ Addendum to the Final Platte River Recovery Implementation Program – First Increment Extension. June 7, 2017.

¹⁰ The First Increment Extension includes the 13-year period 2020-2032. In late 2019, the GC formally approved the First Increment Extension, the Addendum to the Program Document was signed by the Signatories (Colorado, Nebraska, Wyoming, and the Department of the Interior), and the U.S. Congress passed the required funding legislation.



193 This WAP Update Report presents the status of Program water projects at the end of the First
194 Increment in late 2019, just before the transition into the First Increment Extension. Much has
195 changed since the 2014 WAP Update: the major Program water project that dominated the years
196 leading up to that report had to be abandoned;¹¹ several entirely new water project concepts were
197 developed and pursued, with moderate success; and the Program’s priorities under the WAP
198 gradually shifted towards controllable water supplies, e.g., contributions to the Lake
199 McConaughy EA, that will better facilitate water management activities during the First
200 Increment Extension.

201
202 As discussed above, the 2009 and 2014 WAP Updates were tied to specific steps towards the
203 completion of Milestone 4. With a few exceptions, both of those reports provided detailed
204 updates on project descriptions, yield estimates, costs, and next steps for each of the individual
205 WAP projects or project concepts. That is not the intent of this WAP Update Report, which
206 instead aims to more broadly document the past, present, and future of the Program’s WAP
207 implementation efforts:

- 208
209 • **The Past:** Section 2 presents a timeline of the key points in the development of the WAP
210 during the 13 years from the Program’s beginnings in January 2007 to the approval of
211 funding for the First Increment Extension in December 2019. This timeline
212 chronologically documents critical decisions by the GC and the Water Advisory
213 Committee (WAC) regarding Program water projects, the completion of major project
214 studies, and the initiation of new project operations.
- 215 • **The Present:** Section 3 provides an update on the status of the Program’s WAP projects
216 at the end of the First Increment in late 2019. Approved and estimated scores for WAP
217 projects are summarized, but this is mostly a qualitative assessment of projects as active,
218 future, or inactive. The Program’s current water portfolio is also viewed through the lens
219 of controllable versus uncontrollable water supplies. Quantitative evaluations of the
220 Program’s active water projects are presented in separate documentation.¹² Section 4
221 discusses the lessons learned through 13 years of work on a range of WAP project
222 pursuits, both successful and unsuccessful.
- 223 • **The Future:** Section 5 takes a closer look at the future WAP projects identified in
224 Section 3 and lays out a plan for securing at least 120,000 AFY of target flow shortage
225 reduction by the mid-2020s, if not earlier.

226
227 In sum, this WAP Update Report provides a comprehensive historical review of the Program’s
228 WAP-related activities during the First Increment and the outcomes of that work by the end of
229 2019 as well as a roadmap for those additional efforts still needed to achieve Milestone 4 and the
230 First Increment water objective.

¹¹ Technically, the J-2 Project is still officially on hold, but there is no active work being done, and the project is not included in the mix of active and future WAP projects that are expected to reach the 120,000 AFY shortage reduction goal.

¹² As of this writing, the most recent quantitative analysis is the EDO’s 2018 PRRIP Water Projects Accounting memo completed in August 2019. Water projects accounting for 2019 and 2020 is expected to be completed in 2021.



231 2 Water Action Plan Implementation Timeline

232 As explained in Section 1, Milestone 4 dictates that the projects comprising the Program’s WAP
233 have the capacity to provide an average annual deficit reduction of at least 50,000 AF by the end
234 of the First Increment. The evolution of the WAP during the years 2007-2019 can be divided
235 into five distinct phases which were not planned in advance but were derived from a backward-
236 looking perspective after all of the events and decisions described below took place. Breakpoints
237 between phases are not meant to imply exclusive containment of certain project pursuits within
238 specific years but instead provide a useful delineation of major proceedings for describing WAP
239 history. **Figure 2** illustrates these five phases of WAP development activities.
240

Phase I Program began. Water Management Study. 2009 WAP update with tiered priorities.			Phase II Feasibility studies for reservoirs and groundwater recharge. Score analysis protocols. Pathfinder Modification Project.			Phase III Analysis and design of J-2 Project. New groundwater recharge and surface water leasing projects. 2014 WAP update.			Phase IV Pursuit of broad-scale recharge, slurry wall gravel pits, and acquire-and-retire to replace J-2 Project.		Phase V Construction of first broad-scale recharge. Focus shifts to controllable water supplies.	
2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019

241 **Figure 2. Phases of Water Action Plan implementation during Program’s First Increment.**
242

- 243 • **Phase I, 2007-2009:** The Program began on January 1, 2007. By mid-summer that year,
244 a contractor was selected for the Program’s first major water-related study; the Water
245 Management Study (WMS) was completed in two phases in 2008. The Program emerged
246 from the WMS with a priority focus on WAP projects that could support Short Duration
247 High Flow (SDHF) releases, specifically reservoir alternatives in the Central Platte area.
248 In addition, the original 2000 Reconnaissance-Level WAP was updated in 2009, with the
249 various water project options organized into three tiers for prioritization. By mid-2009,
250 some level of preliminary study or information gathering was underway for all 10 Tier I
251 and Tier II projects.
252
- 253 • **Phase II, 2010-2012:** Following the WMS and the 2009 WAP Update, the 2010-2012
254 era was marked by a focus on pre-feasibility and feasibility-level studies for several
255 reservoir storage and groundwater recharge projects. These included regulating
256 reservoirs to be located within the Central Nebraska Public Power and Irrigation District
257 (CNPPID) system, an Elm Creek regulating reservoir option, and Nebraska groundwater
258 recharge and management. Reservoir options were winnowed down to a preferred
259 alternative in the area of the J-2 Return. Groundwater recharge advanced to a pilot study
260 at the Phelps County Canal. Protocols were developed for “score” analysis to quantify
261 the potential for WAP projects to reduce deficits to target flows. Also during this phase,
262 Wyoming constructed the Pathfinder Modification Project, creating the Pathfinder
263 Environmental Account (EA) and the Wyoming Account (aka Municipal Account).



264 Independent of the Program, the Central Platte Natural Resources District (CPNRD)
265 initiated its own groundwater recharge pilot project in 2011, using the Thirty Mile,
266 Cozad, and Orchard-Alfalfa canals. Long after applications were originally filed in the
267 late 1990s, Colorado’s water rights for the Tamarack groundwater recharge project were
268 finally approved in 2012.

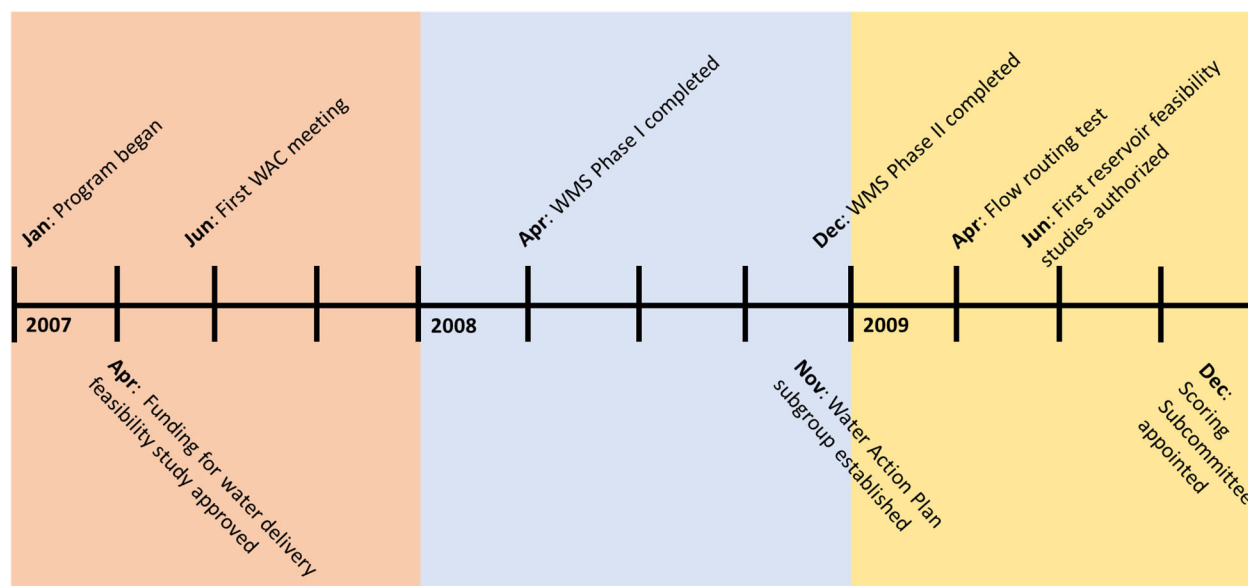
- 269
- 270 • **Phase III, 2013-2015:** With the potential to both supplement SDHF releases and meet as
271 much as 60 percent of the score credit needed from the WAP, analysis and design of the
272 J-2 Project dominated the years 2013-2015. The project advanced to a final design phase
273 by mid-2015 when updated cost assessments suddenly pushed the project far beyond the
274 limits of the Program’s budget constraints. Attempts were made to reconfigure the J-2
275 Project at a smaller scale, but to no avail, and the work was ultimately brought to a halt.
276 Several other groundwater recharge and surface water leasing projects emerged during
277 this phase, and by the end of 2015, the Program had recharge and/or leasing agreements
278 with CPNRD, CNPPID, and the Nebraska Public Power District (NPPD).
279
 - 280 • **Phase IV, 2016-2017:** While efforts to save the J-2 Project were still underway, the
281 Program scrambled to develop new WAP project concepts that could supplement a
282 smaller J-2 Project or replace it altogether. Ideas that were pursued during the years
283 2016-2017 included “broad-scale” groundwater recharge across large tracts of land,
284 below grade reservoir storage in slurry wall gravel pits, and a plan to “acquire-and-retire”
285 agricultural water supplies that would be converted to instream use for the benefit of the
286 Program’s subject threatened and endangered species. The year 2017 saw the selection
287 of contractors for engineering design of the Program’s first broad-scale recharge (BSR)
288 project at the Cottonwood Ranch complex and the first slurry wall gravel pit project at an
289 existing aggregate materials mine site known as Lakeside. At the same time, the Program
290 sought to identify and purchase lands to build more of these projects in future years. A
291 single irrigated parcel was purchased for the purpose of implementing an acquire-and-
292 retire project, but the effort proved to be unsuccessful and the project concept was
293 eventually abandoned. Despite these multifaceted efforts, it became evident that the
294 timeline to develop alternatives to the J-2 Project was such that the First Increment Water
295 Objective would not be achievable by the end of 2019. In response, plans were made for
296 a First Increment Extension, with the expectation of meeting the water objective by the
297 mid-2020s.
298
 - 299 • **Phase V, 2018-2019:** Design of the BSR and slurry wall gravel pit projects continued to
300 advance. Construction of the BSR project at the Program’s Cottonwood Ranch complex
301 began in late 2018 and was completed a year later after extensive weather-related delays.
302 Design of the Lakeside slurry wall gravel pit progressed to completion at the end of 2019.
303 However, as the design evolved, construction costs kept escalating and the potential
304 project score kept shrinking, prompting the Program’s GC to shelve the design and not
305 proceed with construction. The experience with both of these infrastructure projects led
306 the Program to back off on plans to pursue more of either BSR or slurry wall gravel pit
307 projects. Instead, priorities shifted to focus on controllable water supplies that would



308 more effectively support Adaptive Management Plan activities anticipated during the
 309 First Increment Extension. This revised approach encompassed greater contributions to
 310 the Lake McConaughy EA and the development of recapture wellfields to improve the
 311 efficiency of existing groundwater recharge projects. After recognizing that direct
 312 returns to the Platte River during the irrigation season were providing limited deficit-
 313 reduction benefit to the Program, the former included re-envisioning the CPNRD
 314 (beginning 2018) and NPPD (beginning 2019) surface water leases as credits to the Lake
 315 McConaughy EA. The latter would take advantage of abundant volumes of water
 316 recharged during the First Increment that would otherwise slowly migrate to the river
 317 over decades.

318
 319 At the end of 2019, the GC approved extending the First Increment through 2032, the agreement
 320 was signed by the governors of the three Platte River basin states and the Secretary of the
 321 Interior, and legislation funding the First Increment Extension was passed by Congress.
 322

323 For the purposes of a thorough historical accounting of these experiences, the following pages
 324 provide a year-by-year timeline of WAP implementation during the Program’s First Increment.
 325 Major milestones and decision points for the Program’s water projects were identified through a
 326 comprehensive review of the minutes from every Water Advisory Committee (WAC) and GC
 327 meeting that occurred from 2007 through 2019. **Figure 3** highlights the events and decisions for
 328 the period 2007-2009.
 329



330 **Figure 3. WAP implementation timeline, 2007-2009.**

331 2007

- 332 • **January 2007:** Platte River Recovery Implementation Program (PRRIP or Program)
- 333 began.
- 334 • **April 2007:** GC approved funding for a water delivery feasibility study as specified in
- 335 Section III.E.2.d.ii of the Program Document.
- 336



- 337
- **June 2007:** First WAC meeting.
 - **August 2007:** WMS was underway. Objectives were to “examine routing alternatives for delivery of Program water via the River or via NPPD/CNPPID facilities and re-examine the Water Action Plan Alternatives for on-going viability and develop new concepts to meet Program water supply objectives.”
- 338
- 339
- 340
- 341
- 342

2008

- 343
- **April 2008:** WMS Phase I completed.
 - **May 2008:** WMS Phase II progress review and alternatives screening workshop held. “The direction from the discussion was to move forward with projects that are most suited to contribute to the goal of a pulse flow.”
 - **July 2008:** WAC selected three downstream reservoir alternatives to supplement pulse flows: Elwood Reservoir, Plum Creek sites, and off-channel Central Platte Reregulating Reservoirs generally associated with CNPPID facilities that release directly to the river. These were to be carried forward for reconnaissance-level evaluation in WMS Phase II.
 - **November 2008:** WAC established subgroup to “advance evaluation of Water Action Plan projects,” including reservoir feasibility studies. Focus was on getting a project in place to make a pulse release while moving forward on the WAP.
 - **December 2008:** WMS Phase II completed.
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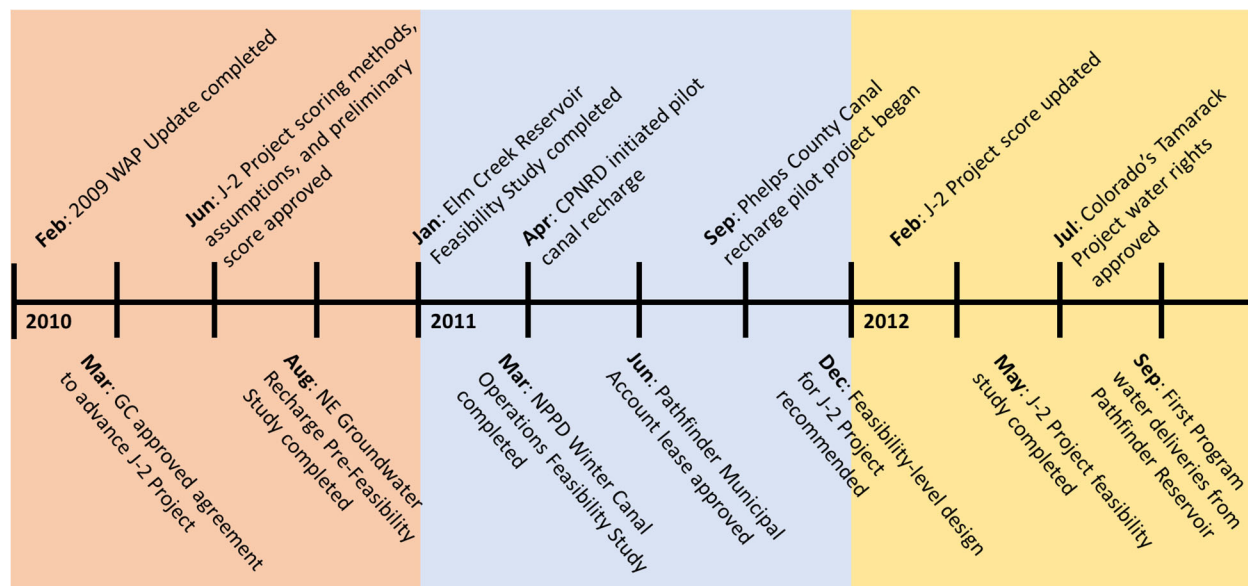
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- 357
- **April 2009:** Program successfully conducted flow routing test. North Platte River at North Platte flow capacity at 6.0 ft minor flood stage estimated to be 1,700 cfs to 1,800 cfs. Around this time, Adaptive Management Working Group introduced the term “short duration high flows” (SDHF) to describe 2- to 5-day flow objectives.
 - **May-November 2009:** Tiered priorities were defined for WAP projects identified in 2000 Reconnaissance-Level WAP. Tier I projects were those being actively advanced. Additional information was being collected to help advance the Tier II projects. Tier III projects were to be worked on in the future. Emphasis was on projects that could support SDHF. During this period, some level of project evaluation or information update process was underway for all 10 Tier I and Tier II WAP projects.
 - **June 2009:** GC approved proceeding with Phase I studies for CNPPID Reregulating Reservoirs (Elwood and J-2 Return), to include conceptual alternatives and prefeasibility analysis.
 - **November-December 2009:** CNPPID Reregulating Reservoirs pre-feasibility study was proceeding with aggressive schedule. New reservoir in the J-2 Return area emerged as favored alternative, with little or no contribution from Elwood Reservoir, and the WAC recommended advancement to a Phase II full feasibility study.
 - **December 2009:** GC appointed a Scoring Subcommittee to investigate unresolved issues related to target flows and how they would be used in scoring Program water projects.
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379 **Figure 4** illustrates the WAP timeline for the years 2010-2012.

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Figure 4. WAP implementation timeline, 2010-2012.

383 2010

- 384 • **February 2010:** 2009 WAP Update completed and approved by WAC. CNPPID
- 385 Reregulating Reservoir Phase I (Pre-feasibility) final report completed and approved by
- 386 WAC.
- 387 • **March 2010:** GC approved an agreement between the Program and CNPPID to advance
- 388 the J-2 Regulating Reservoirs Project (J-2 Project), with possible contributions from
- 389 Elwood Reservoir, through full feasibility.
- 390 • **May 2010:** Following the completion of a pre-feasibility study for an Elm Creek
- 391 Regulating Reservoir project led by CPNRD, potential Program benefits were being
- 392 evaluated.
- 393 • **May-June 2010:** Scoring Subcommittee presented an initial score analysis case study
- 394 based on the J-2 Project. GC approved the methods and assumptions used along with a
- 395 preliminary score for the project.
- 396 • **August 2010:** Nebraska Groundwater Recharge Pre-Feasibility Study completed. The
- 397 original project concept involving Gothenburg and Dawson County Canals was expanded
- 398 to include other sites; Phelps County Canal (to Mile Post 9.7) and Gothenburg Canal
- 399 (area south of golf course) were recommended for further feasibility-level analysis.
- 400 Construction of the Pathfinder Modification Project began.
- 401 • **December 2010:** Work begins on the Nebraska Groundwater Recharge Feasibility
- 402 Study, with a focus on Phelps County Canal.

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404 2011

- 405 • **January 2011:** Elm Creek Regulatory Reservoir Feasibility Study completed.



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- **March 2011:** NPPD Canal Winter Operations Feasibility Study completed, assessing viability of recharge operations for the benefit of the Program.
 - **April-May 2011:** CPNRD initiated diversions of excess flows¹³ for groundwater recharge operations using the Thirty Mile, Cozad, and Orchard-Alfalfa canals.
 - **June 2011:** GC approved lease agreement for an average of 4,800 AFY from the Pathfinder Municipal Account for the remainder of the First Increment (38,400 AF total volume for 2012-2019). Program decided to not move forward with participation in the Elm Creek Regulating Reservoir project due to water supply issues, landowner impacts, lower yields compared to the J-2 Project, and other factors.
 - **September 2011:** Excess flow diversions to supply the Phelps County Canal groundwater recharge pilot project to the check location at Mile Post 9.7 began at the end of the month and continued until early January 2012. GC passed motion declaring the J-2 Project to be the best alternative and most feasible water supply available to the Program.
 - **December 2011:** CNPPID Reregulating Reservoir Workgroup recommended to the GC a feasibility-level design for J-2 Project with a combined capacity of 13,959 AF in two reservoir cells, filled through the Phelps County Canal with an increased capacity of 1,675 cfs. This reservoir would be used by the Program for both target flow operations and SDHF releases, as well as to provide flow regulation and hydrocycling mitigation for CNPPID. Construction of the Pathfinder Modification Project completed.

426 2012

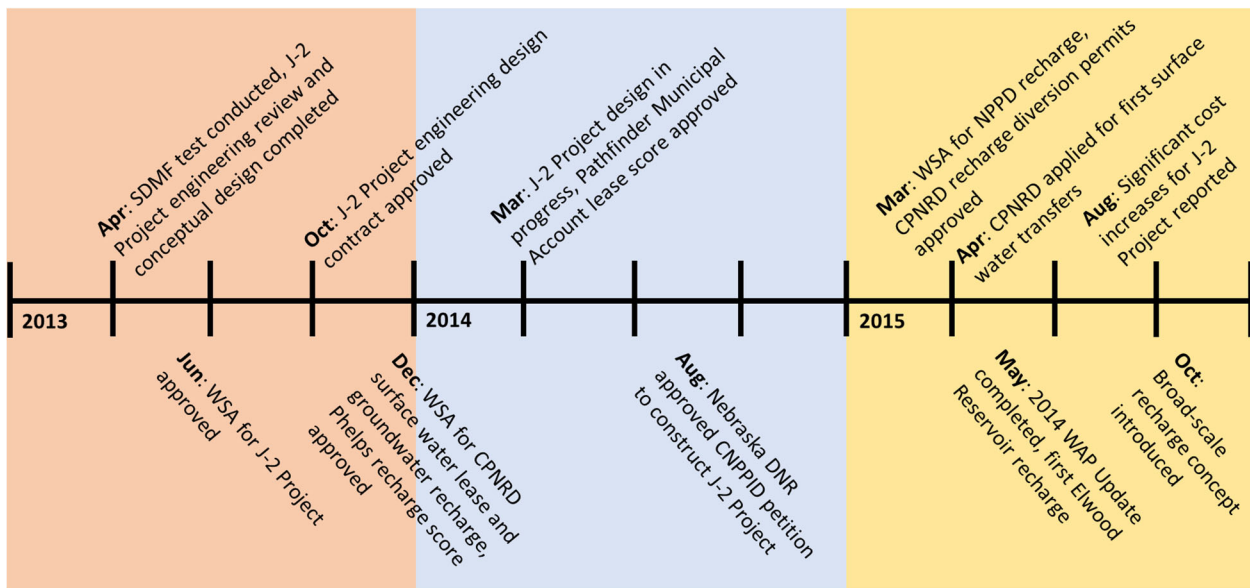
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- **February 2012:** Updated score analysis for the J-2 Project was completed using the methodology approved by the GC in June 2010 with the recommended design parameters and revised operations assumptions. A total project score of 40,800 AFY was recommended, with 75% (30,600 AFY) credited to the Program and the balance to Nebraska Department of Natural Resources (DNR).
 - **May 2012:** Final report of the CNPPID J-2 Reregulating Reservoir Feasibility Study completed.
 - **June 2012:** GC appointed a new Scoring Subcommittee to address groundwater recharge and water leasing scoring questions.
 - **July 2012:** Pilot-Scale Recharge Report for the Nebraska Groundwater Recharge Feasibility Study completed. Colorado water rights for the Tamarack Project were decreed, concluding a process that began in 1996.
 - **August 2012:** CPRND offer to lease surface water and accretions from groundwater recharge to the Program first presented to the WAC. CPNRD already initiated necessary rehabilitation and construction work on the Thirty Mile, Cozad, and Orchard-Alfalfa canals.

¹³ Streamflows in excess of targets are determined based on the river conditions at Grand Island, NE and USFWS target flows as dictated by the real-time hydrologic condition. Grand Island is at the lower end of the Program's associated habitat reach and is also downstream of diversions that may impact water availability for Program projects. Excess flows are theoretically the same as free river water in that the availability of excesses is dependent on the needs of all other (senior) water users including instream water for fish and wildlife purposes having been met already, but in recent years Nebraska DNR has taken steps to more closely regulate the allocation of excess flows to better ensure equitable distribution among multiple recharge projects for the Program and other entities.



- 443 • **September 2012:** First water delivered from Pathfinder EA and Pathfinder Municipal
- 444 Account
- 445 • **December 2012:** Phelps County Canal groundwater recharge resumed and continued
- 446 into March 2013, with operations extended to the check location at Mile Post 13.3.
- 447 Water from the Lake McConaughy EA was used for recharge during the 2012-2013
- 448 season due to dry conditions and a lack of available excess flows. The project continued
- 449 to operate for the next several years under a succession of one-year Water Service
- 450 Agreements (WSA) between the Program and CNPPID and temporary annual excess
- 451 flow diversion permits issued by Nebraska DNR.
- 452

453 The timeline for WAP development during the years 2013-2015 is shown in **Figure 5**.



455 **Figure 5. WAP implementation timeline, 2013-2015.**

456 2013

- 457 • **February 2013:** Program and NPPD initiated discussions of surface water leasing
- 458 opportunities.
- 459 • **April 2013:** Engineering review, conceptual design, and updated cost assessment for the
- 460 J-2 Project completed. Short Duration Medium Flow (SDMF) test was conducted.
- 461 • **June 2013:** GC approved WSA between the Program, CNPPID, and Nebraska DNR for
- 462 the two-cell J-2 Project.
- 463 • **September-October 2013:** Excess flows resulting from Colorado flood event were
- 464 diverted into several Nebraska canals and Funk Lagoon to decrease peak flows and
- 465 recharge groundwater.
- 466 • **October 2013:** CNPPID board approved engineering design contract for J-2 Project.
- 467 • **December 2013:** GC approved recommended score of 1,800 AFY for the Phelps County
- 468 Canal groundwater recharge project, based on a 50% project share for the Program. GC
- 469 approved Water Use Lease Agreement with CPNRD for up to 20,500 AF at the river each
- 470



471 year from a combination of transferred surface water and accretions from groundwater
472 recharge of excess flows in the Thirty Mile, Cozad, and Orchard-Alfalfa canals. Program
473 made initial purchase of recharge accretions from CPNRD. After working on cost issues
474 since 2009, GC declined to accept high-dollar lump sum offer from CNPPID to purchase
475 Net Controllable Conserved Water (NCCW).
476

477 2014

- 478 • **February 2014:** Project concept to lease water from CNPPID irrigators first presented to
479 WAC.
- 480 • **March 2014:** By this time, engineering design, permitting, land acquisition, and other
481 elements of the J-2 Project were already or soon to be in progress. GC approved a score
482 of 4,000 AFY for the Pathfinder Municipal Account Lease project.
- 483 • **May 2014:** A potential lease agreement for CNPPID storage water in Lake McConaughy
484 was proposed as an alternative to the NCCW offers declined in 2013.
- 485 • **August 2014:** Elwood Reservoir groundwater recharge was introduced as a potential
486 WAP project. Preliminary analysis of groundwater pumping (recharge recapture) under
487 the Phelps County Canal was presented as a WAP project concept that is cost effective
488 and can be implemented quickly compared to other projects. Nebraska DNR approved
489 CNPPID petition to construct the J-2 Project as new return flow points for existing
490 appropriations.
- 491 • **October 2014:** CPNRD reported that construction and rehabilitation of the three canal
492 systems used for groundwater recharge and surface water leasing was complete.
- 493 • **November 2014:** Public hearings on land acquisitions for the J-2 Project site were held.
494

495 2015

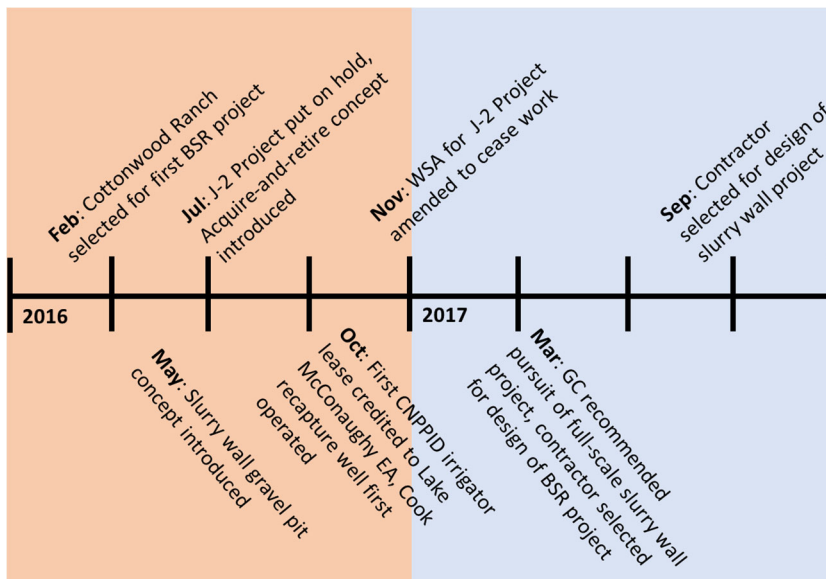
- 496 • **February 2015:** Design and permitting activities for the J-2 Project continued to
497 progress.
- 498 • **March 2015:** GC approved WSA with NPPD for groundwater recharge in the
499 Gothenburg and Dawson County canals. Nebraska DNR approved permanent permit
500 applications (filed in 2012) to divert excess flows for groundwater recharge in the Thirty
501 Mile, Cozad, and Orchard-Alfalfa Canals. All other groundwater recharge projects
502 operated for the benefit of the Program continued to require temporary annual excess
503 flow diversion permits.
- 504 • **April-June 2015:** CPNRD submitted permit applications for temporary surface water
505 transfers from the Thirty Mile, Cozad, and Orchard-Alfalfa canals. By the end of the
506 irrigation season, the pilot project returned a net volume of about 14,000 AF to the river
507 for the Program. The project continued to operate in this manner through the 2017
508 irrigation season.
- 509 • **May 2015:** The 2014 WAP Update was completed, providing comprehensive updates on
510 the status of all WAP projects. A pilot project to pump groundwater recharged in the
511 Phelps County Canal directly to the river was being developed for the Cook property
512 owned by the Program. With significant excess flows available, the Program and
513 CNPPID entered into a WSA and began groundwater recharge at Elwood Reservoir as a
514 pilot project. After operating intermittently during construction and rehabilitation (2012-



515 2014), excess flow diversions for groundwater recharge resumed at all three CPNRD
 516 canals.

- 517 • **June 2015:** GC formally approved proceeding with the recapture well pilot project.
- 518 • **August 2015:** New analysis indicated significant cost increases for the J-2 Project.
- 519 • **September 2015:** GC approved agreement for a one-year pilot project to lease water
 520 from CNPPID irrigators. GC authorized investigation of ways to continue the J-2 Project
 521 within existing budget constraints. First excess flow diversions for Program groundwater
 522 recharge at Gothenburg and Dawson County canals.
- 523 • **October 2015:** Alternatives for a reconfigured J-2 Project were being developed by the
 524 design consultant. Broad-scale recharge was introduced as an option to supplement a
 525 reduced-capacity J-2 Project. This project concept would involve groundwater recharge
 526 on large land areas and could be scaled up on an incremental basis. A feasibility study
 527 concluded that Funk Lagoon is not good for either water storage or groundwater
 528 recharge. WAC recommended against further pursuit of Funk Lagoon as a WAP project.
- 529 • **November 2015:** GC expressed concern about meeting the First Increment Water
 530 Objective and suggests that an extension may need to be considered.
- 531 • **December 2015:** GC authorized renegotiation of WSA for the J-2 Project, to be
 532 reconfigured as a single cell of the maximum size possible within existing budget
 533 constraints. GC approved new temporary WSA with CNPPID that increased the Program
 534 share of the Phelps County Canal groundwater recharge project from 50% to 75% and
 535 another that continued the Elwood Reservoir recharge project with a 50% Program share.
 536 Tri-Basin NRD approved permit for well on Cook property to pump recharged
 537 groundwater.
 538

539 **Figure 6** shows major WAP activities during 2016-2017.
 540



541 **Figure 6. WAP implementation timeline, 2016-2017.**
 542

543 2016

- 544 • **February 2016:** By this time, the Program was focused on Cottonwood Ranch for an
545 initial broad-scale recharge project. A conceptual design and plans for a feasibility study
546 were already in progress.
- 547 • **March 2016:** GC approved score of 260 AFY for the No-Cost NCCW as a stand-alone
548 WAP project based on conservation improvements in the CNPPID system that were
549 funded by the U.S. Bureau of Reclamation, resulting in 314 AF credited to the Lake
550 McConaughy EA each year at no cost to the Program.
- 551 • **May 2016:** The slurry wall gravel pit concept was first introduced to the WAC as a
552 potential WAP project for retiming excess flows.
- 553 • **July 2016:** Program Water Plan A and Plan B were presented to the GC to demonstrate
554 how the First Increment Water Objective could be achieved with and without the J-2
555 Regulating Reservoirs Project. The “acquire and retire” WAP project concept was
556 introduced as part of Water Plan B. GC put the J-2 Project on hold and approved moving
557 forward with work on potential broad-scale recharge, slurry wall gravel pit, and acquire
558 and retire projects. GC approved purchase of first property intended to be developed as
559 an acquire and retire project, a small parcel under the Alliance Canal near Bayard,
560 Nebraska.
- 561 • **September 2016:** Consistent with the then-most recent WSA, GC approved proportional
562 increase to Phelps County Canal groundwater recharge project score from 1,800 AFY
563 (50%) to 2,700 AFY (75%). GC approved score of 160 AFY for Cook recapture well.
- 564 • **October 2016:** CNPPID irrigator lease pilot project resulted in 778 AF credited to the
565 Lake McConaughy EA based on initial enrollment of 1,037 acres and a yield of 9 inches
566 per acre. The project continued to operate on an annual pilot basis for the 2017 and 2018
567 irrigation seasons, with increasing enrollment each year.
- 568 • **October-November 2016:** Cook recapture well first operated to reduce shortages to
569 target flows.
- 570 • **November 2016:** GC amended WSA with CNPPID and Nebraska DNR for the J-2
571 Project to cease future work on the project after completion of specific tasks already in
572 progress. With the project officially on hold, the approved score of 30,600 AFY was
573 effectively nullified. GC approved First Increment Extension Proposal.

574
575 2017

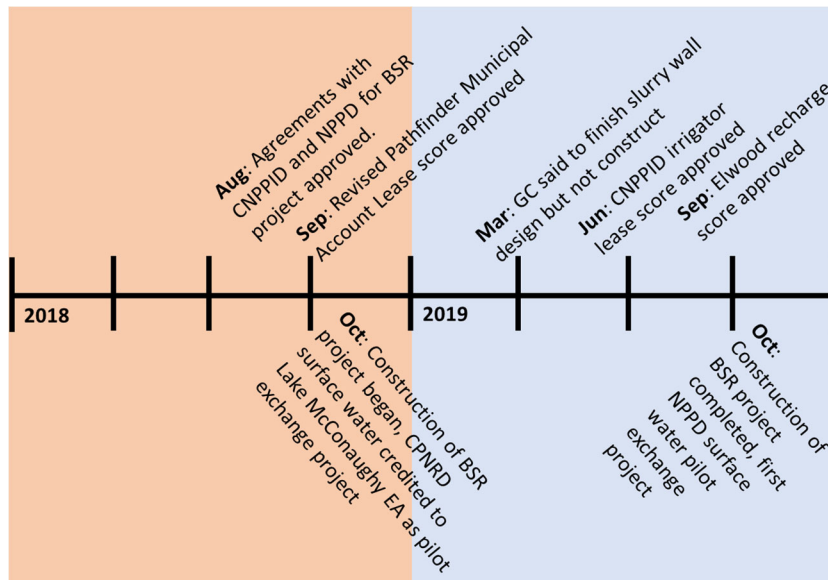
- 576 • **February 2017:** The Program’s Executive Director’s Office (EDO) presented a road
577 map for completing WAP projects with a cumulative score greater than 40,000 AF by the
578 mid-2020s. This plan was heavily dependent on broad-scale recharge, slurry wall gravel
579 pits, acquire and retire, and recapture wells to replace the J-2 Project.
- 580 • **March 2017:** GC recommended pursuit of a full-scale initial slurry wall project at an
581 existing gravel pit site and authorized land acquisition related to the project. Contractor
582 was selected for engineering design and construction administration of a broad-scale
583 recharge project at Cottonwood Ranch. Initial efforts were underway to begin
584 quantifying water use at the Alliance Canal acquire and retire property. The plan was to
585 continue irrigation for several years and collect data needed to quantify consumptive use.



- **September 2017:** Contractor was selected for engineering design and construction administration of the initial slurry wall gravel pit project, to be located at the Lakeside Pit near the Elm Creek interchange.

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Major WAP events and decisions during the years 2018-2019 are shown in **Figure 7**.



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Figure 7. WAP implementation timeline, 2018-2019.

594 2018

- **August 2018:** GC approved WSA with CNPPID for delivery of water to the broad-scale recharge project via a pipeline to be constructed from Phelps County Canal to Cottonwood Ranch. GC approved Cottonwood Ranch land use agreement between Program and NPPD. GC concurred that final design of the Lakeside slurry wall gravel pit project can proceed. CPNRD announced a proposed reconfiguration of the surface water lease as a “pilot exchange project” to keep that water in storage—rather than direct returns from the canals to the river—for credit to the Lake McConaughy EA.
- **September 2018:** GC approved revised score of 6,350 AFY for the Pathfinder Municipal Account Lease to better reflect actual project deliveries during the First Increment. GC approved agreement extending the CNPPID irrigator lease for 5 years (through the 2023 growing season) with an annual enrollment cap of 3,000 acres.
- **October 2018:** Construction of the Cottonwood Ranch broad-scale recharge project began. The CPNRD surface water pilot exchange project resulted in a credit of 14,251 AF to the Lake McConaughy EA, and the project continued with similar terms in 2019.
- **November 2018:** After attempts to purchase adjacent irrigated lands were unsuccessful, GC approved sale of the Program’s Alliance Canal property, effectively ending acquire and retire as an active WAP project pursuit.

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614 2019

- 615 • **March 2019:** GC approved contract extending Pathfinder Municipal Account lease
616 through 2032. GC gave direction to finalize the Lakeside slurry wall gravel pit design
617 and bring the project to a bid-ready status, but construction was not to proceed.
- 618 • **June 2019:** GC approved score of 1,900 AFY for the CNPPID irrigator lease project.
619 GC approved agreement for NPPD surface water lease, to be operated as a pilot exchange
620 project consistent with the CPNRD surface water lease. GC approved WSA extending
621 the Elwood Reservoir groundwater recharge project through 2023.
- 622 • **August 2019:** EDO completed first comprehensive accounting of Program water project
623 operations during the First Increment through 2018. Preliminary WAP project concept
624 for an extensive wellfield to recapture groundwater from the Phelps County Canal,
625 Elwood Reservoir, and Cottonwood Ranch recharge projects was introduced to the WAC.
- 626 • **September 2019:** GC approved score of 2,800 AFY for the Elwood Reservoir
627 groundwater recharge project. GC approved WSAs extending three groundwater
628 recharge projects: Phelps County Canal (through 2023), CPNRD (through 2024), and
629 NPPD (through 2025).
- 630 • **October 2019:** Construction of the Cottonwood Ranch broad-scale recharge project
631 completed. The NPPD surface water pilot exchange project resulted in 3,121 AF credited
632 to the Lake McConaughy EA.
- 633 • **November 2019:** GC approved motion to extend the First Increment though 2032.
- 634 • **December 2019:** Congress passes legislation funding the First Increment Extension
635 through 2032.

636
637 Although there is still work to be done, the Program made significant strides towards
638 achievement of Milestone 4 and the First Increment Water Objective during the 13 years from
639 2007-2019. Numerous water project concepts were evaluated, and many that were determined to
640 be feasible within the Program’s temporal and budgetary constraints were advanced to full-scale
641 development and operation. Other project pursuits holding great promise for the Program
642 collapsed in an untimely matter. Rather than giving up on meeting water-related goals, though,
643 the Program adapted and responded by conceiving and pursuing new strategies, many of which
644 remain in progress.

645 **3 Status of Program Water Projects**

646 The EDO routinely updates the WAC and GC on the status of active WAP projects and those
647 that are in the development process. In the last couple years of the First Increment, a quarterly
648 Water Objective Summary was prepared and presented to the GC to provide regular updates on
649 progress towards completion of the Program’s target flow shortage reduction goals. Examples of
650 the Water Objective Summary from September and December 2019 are included in **Appendix B**.

651
652 The tier structure introduced in the 2009 WAP Update to help prioritize the Program’s 13 WAP
653 project pursuits was highly effective at establishing a path forward early in the First Increment
654 but became less so over time as more projects were found to be infeasible or limited by other
655 constraints. Another layer of organization was added in the 2014 WAP Update, as projects were



656 also designated as having active, future, or inactive status. Unlike the tiered priorities, these
657 status descriptors continued to be useful at the end of the First Increment and were retained for
658 this WAP Update Report. Future status now applies to WAP project pursuits that are to occur
659 during the First Increment Extension in 2020 and beyond.

660 **3.1 Active WAP Projects**

661 As the First Increment drew to a close, there were 11 individual active WAP projects,
662 representing only four of the 13 tiered WAP projects evaluated in the 2009 WAP Update. Of the
663 seven projects that were assigned Tier I priority in 2009, only two remained fully active by 2019,
664 along with a very small portion of a third:

- 665 • Nebraska groundwater recharge
- 666 • Pathfinder Municipal Account lease
- 667 • Net Controllable Conserved Water (NCCW) – No Cost¹⁴

668 There were three projects designated as Tier II in 2009, and Nebraska water leasing was the only
669 one of those projects still active in late 2019.

672 **3.1.1 Changes to WAP Project Concepts**

673 Some of the WAP project concepts evolved or expanded significantly from the original
674 conception in the 2000 Reconnaissance-Level WAP or one of the later updates in 2009 and 2014.
675 The following sections provide examples of both types of project changes.

677 **3.1.1.1 Nebraska groundwater recharge**

678 Nebraska groundwater recharge is an example of a project concept expanding, having started
679 with the idea of using only the Gothenburg and Dawson County canals owned and operated by
680 NPPD for recharge via surface water diversions and canal seepage during the non-irrigation
681 season. At the time of the 2009 WAP Update, the Nebraska groundwater recharge pre-feasibility
682 study was underway; the project concept was expanded to include Phelps County Canal
683 recharge, which progressed to a pilot study in 2011 and full-scale operations in 2012. The pre-
684 feasibility study also started to incorporate elements of the Nebraska groundwater management
685 project such as recapture wells, which the 2009 WAP Update described as allowing for “active
686 pumping of recharged water for release to the Platte River during times of shortages to target
687 flows.”

689

¹⁴ The NCCW is a pool of water in Lake McConaughy that was made available by the implementation of irrigation efficiency improvements and other water-saving measures in the CNPPID system during the 1990s, which resulted in a net savings compared to historical water use. A small portion (314 AFY) of the NCCW is available at no cost to the Program because of conservation measures that were paid for by the U.S. Bureau of Reclamation. The much larger portion (10,586 AFY) of NCCW that was available for purchase by the Program has been inactive since the GC declined the offers to purchase from CNPPID in December 2013. The distinction of NCCW (No Cost) and NCCW (Purchased) as separate WAP projects was not introduced until the 2014 WAP Update, after the purchase offers were declined.



690 By the time of the 2014 WAP Update, recharge was also active at the CPNRD canals (Thirty
691 Mile, Cozad, and Orchard-Alfalfa). The potential to use CNPPID’s Elwood Reservoir for
692 recharge was being considered and came to fruition during high flows in May 2015. Recharge
693 first occurred at the Gothenburg and Dawson County canals in September 2015, representing
694 fulfillment of the original Nebraska groundwater recharge project concept.

695
696 The installation of the Program’s first recapture well and the development of broad-scale
697 recharge came in the years after the 2014 WAP Update. Broad-scale recharge was a new project
698 concept that emerged during 2015-2016 as an alternative to the J-2 Project. Most of the active
699 recharge projects were designed to take advantage of seepage from existing, earth-lined
700 irrigation facilities (i.e., canals and reservoirs), but the broad-scale recharge project implemented
701 at the Program’s Cottonwood Ranch property involved all new construction.¹⁵ Specifically, a
702 series of low berms (< 6 ft) was built to temporarily retain water in shallow ponds in eight
703 interconnected cells spread broadly across an area of more than 400 acres. When filled during
704 the spring and fall migrations, the broad-scale recharge project will also provide ancillary benefit
705 as crane habitat.

706

707 **3.1.1.2 Nebraska water leasing**

708

709 Nebraska water leasing demonstrates the evolution of a WAP project, in terms of both the source
710 of water and the nature of project operations. The project was described in the 2000
711 Reconnaissance-Level WAP as follows:

712

713 The project evaluated assumes that leased water rights are dependent on storage rights in
714 Lake McConaughy. In general, water will be leased from an irrigation district or farmer
715 with storage rights in Lake McConaughy. The reduction in consumptive use will likely
716 be added to the EA when storage space is available and released during times of shortage
717 at the critical habitat...Although it may be feasible to lease natural flow water rights, it
718 will be more difficult to [e]nsure protection.

719

720 Prioritized as a Tier II project in the 2009 WAP Update, the report presented very little new
721 information about Nebraska water leasing, but it was “anticipated that this project may be
722 initiated in 2012 and completed by the end of 2016.”

723

724 In 2012, the offer for the Program to lease surface water from the CPNRD canals was first
725 presented, and CPNRD began canal rehabilitation work to facilitate the operations of such a
726 project. The preceding years saw major changes in irrigation practices, as there was a
727 widespread shift from surface water to groundwater sources following the early 2000s drought,
728 and the consumptive use portion of the now-unused surface water became the supply available
729 for leasing by the Program. The CPNRD canals had water portfolios including both natural flow

¹⁵ Construction of the Cottonwood Ranch broad-scale recharge project was completed in October 2019. Initial fill operations were planned for summer 2020, after the establishment of vegetation on the berms. Water is delivered to Cottonwood Ranch through a pipeline from the Phelps County Canal.



730 and storage water,¹⁶ but in a deviation from the original project concept, it was determined that
731 only the natural flow water could be leased. In December 2013, the Program and CPNRD signed
732 a Water Use Lease Agreement for up to 20,500 AFY from the combination of transferred surface
733 water and accretions from groundwater recharge. The agreement stated that water may be
734 provided to the Program specifically from the “natural flow associated with transferred surface
735 water” and confirmed that “lands previously irrigated by these now transferred surface water
736 rights will instead be irrigated by ground water pumped from existing wells.”

737
738 For the first three years of CPNRD surface water lease operations (2015-2017), natural flow
739 water was diverted at the canal headgates during the irrigation season, and measured amounts of
740 consumptive use water were returned directly to the Platte River through newly constructed
741 turnouts on the downstream sides of the headgates. After accounting for depletions from
742 groundwater pumping for irrigation, the net accretions to the river were less than the gross river
743 returns. Even though the real-time hydrologic condition during these years was almost always
744 “normal” or “wet,” the leased surface water was continuously returned to the river regardless of
745 whether there were target flow shortages or excesses at Grand Island.¹⁷ This meant that the net
746 volume of surface water accretions purchased by the Program (ranging from 13,759 AF to
747 15,777 AF) was typically much larger than the volume that could be credited with reducing
748 target flow shortages.

749
750 In 2018-2019, after recognizing that the project as implemented was an inefficient way to meet
751 Program goals, the CPNRD worked with Nebraska DNR and CNPPID to reconfigure the
752 operations so that the leased surface water was credited to the Lake McConaughy EA in October
753 instead of being returned directly to the river during the irrigation season. This was
754 accomplished by not delivering irrigation water that would otherwise be released for diversion
755 by the CPNRD canals downstream. The change in approach brought the Nebraska water leasing
756 project in a full circle back to the original concept of adding leased irrigation water to the Lake
757 McConaughy EA. Volumes credited in both years exceeded 14,000 AF.

758
759 As far back as 2013, the Program and NPPD sought to develop a similar project based on leasing
760 surface water from lands historically served by the Gothenburg and Dawson County canals that
761 had switched to groundwater irrigation. Following the successful implementation of the CPNRD
762 pilot exchange project, an NPPD surface water lease was finally carried out in the same manner
763 in 2019, resulting in a credit of 3,121 AF to the Lake McConaughy EA in October of that year.

764
765 Also consistent with the original project concept of leasing from farmers, the Program and
766 CNPPID implemented an irrigator lease starting with the 2016 growing season. Individual

¹⁶ The irrigation districts that operate the CPNRD canals have contracts with NPPD for storage water for irrigation. Under the terms of the 1954 Water Storage Contract between NPPD and CNPPID, that water is stored in Lake McConaughy.

¹⁷ Based on analysis of available data, CPNRD recorded 67 days during the 2015 irrigation season on which at least one of the three canals was making river returns of transferred surface water. There were real-time target flow shortages at Grand Island on only 14 of those days (21%). CPNRD spreadsheets from 2016 show 71 days with surface water returns, and 23 of those days (32%) had shortages. Of the gross water volumes returned to the river from the CPNRD canals before adjusting for groundwater pumping depletions, approximately 17% (2015) and 39% (2016) occurred on those days with shortages at Grand Island. The EDO does not have this data for 2017.



767 irrigators in the CNPPID system enroll specific parcels of land that will not be irrigated, and a
 768 portion of the saved water is credited to the Lake McConaughy EA in October each year.
 769 Enrollment in the irrigator lease grew each year from 1,037 acres (778 AF)¹⁸ the first year to
 770 2,934 acres (2,201 AF) in 2019. Potential new permutations of Nebraska water leasing are
 771 discussed in Section 5.

772 **3.1.2 Score Summary for Active WAP Projects**

773 **Table 1** provides a status summary of all active WAP projects as of late 2019. A larger version
 774 of this table with additional annotations is included in an October 2019 memo in **Appendix C**.

775 **Table 1. Summary of Active WAP Projects.**
 776

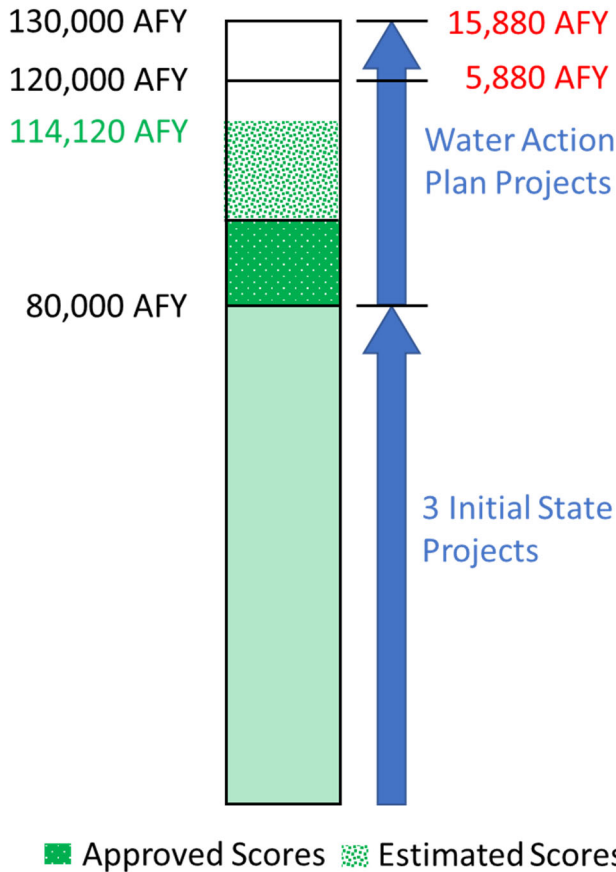
Project	Year of First Operations	Score [AFY]	Score Status	Notes
Nebraska Groundwater Recharge¹				
Phelps County Canal	2011	2,700	Approved	WSA through 2023
Cook Recapture Well	2016	160	Approved	Well permit approved 2015
Elwood Reservoir	2015	2,800	Approved	WSA through 2023
CPNRD Canals	2013	600	Estimated	WSA through 2024
NPPD Canals	2015	1,800	Estimated	WSA through 2025
Broad-Scale Recharge	2020	4,000	Estimated	WSA through 2032
Nebraska Water Leasing (Surface Water)				
CNPPID Irrigators	2016	1,900	Approved	Lease agreement through 2023
CPNRD Canals	2015	10,800	Estimated	Pilot exchange 2018-2019
NPPD Canals	2019	2,750	Estimated	Pilot exchange 2019
Other WAP Projects				
NCCW (No Cost)	2007	260	Approved	314 AF annual credit to Lake McConaughy EA
Pathfinder Municipal Account Lease	2012	6,350	Approved	Lease contract through 2032
Active Projects (6) Approved Score =		14,170 AFY		
Active Projects (5) Estimated Score =		19,950 AFY		
Active Projects (11) Total Score =		34,120 AFY		

777 ¹ Nebraska DNR approved individual excess flow diversion permits (A-18922, A-18923, and A-18924) for the three
 778 CPNRD canals (Cozad, Orchard-Alfalfa, and Thirty Mile, respectively) to recharge groundwater in March 2015.
 779 Recharge at Phelps, Elwood, and Cottonwood Ranch is administered under a single temporary annual permit, the
 780 most recent (A-19735) approved November 30, 2020. Current temporary annual permits for NPPD recharge
 781 operations at the Dawson County (A-19682) and Gothenburg (A-19683) canals were approved February 14, 2020.
 782

¹⁸ CNPPID irrigator lease volumes credited to the Lake McConaughy EA are based on 0.75 AF per enrolled acre.



783 Most of the active WAP projects began operations between 2011 and 2019.¹⁹ Six of the active
 784 projects have approved scores, and the EDO developed score estimates for the other five projects
 785 based on actual or anticipated operations. **Figure 8** illustrates the overall progress toward the
 786 First Increment water objective as modified for the First Increment Extension, with the approved
 787 and estimated active WAP project scores (34,120 AFY) combined with the score credit from the
 788 Program’s three initial projects (80,000 AFY).
 789



■ Approved Scores ■ Estimated Scores

790 **Figure 8. Illustration of First Increment water objective progress through 2019.**
 791

792 The overall total score of the Program’s active water projects is estimated to be 114,120 AFY of
 793 target flow shortage reduction. Just under 6,000 AFY is still needed to reach 120,000 AFY; after
 794 reaching that level, the Program will undertake the scientific experiments and analysis as dictated
 795 in the Addendum to the Program Document to determine if the cost of the next 10,000 AFY (to
 796 reach 130,000 AFY) is justified.²⁰

¹⁹ The No-Cost NCCW project is shown to start in 2007 since that is when the Program formally began; however, the Lake McConaughy EA was created earlier, and records show 314 AF credits in most years starting in October 2001. In a few years, the No-Cost NCCW was not credited due to account resets or accidental oversight. Construction of the broad-scale recharge project at Cottonwood Ranch was completed in 2019 and initial operations were expected to follow in 2020.

²⁰ When the terms of the First Increment Extension were agreed upon in 2017, it was expected that the unit costs for the last 10,000 AFY would be substantially higher than the unit costs for those water supplies needed to reach 120,000 AFY. Given potential new leasing opportunities identified later, this concern may prove to be unfounded.



797 **3.1.3 Controllable vs Not Controllable Water Projects**

798 There are only two basic types of active Program water projects, storage and retiming. All of the
 799 active storage projects result in contributions to designated reservoir accounts from storable
 800 natural inflows to the reservoir, conservation savings, or leases. Retiming projects are those that
 801 divert from the river when there are excesses to target flows and return water to the river at a
 802 later time, ideally when there are target flow shortages. Towards the end of the First Increment,
 803 the Program began to view water projects from a new perspective: controllable versus not
 804 controllable. **Table 2** presents all of the active Program water projects (three initial projects plus
 805 WAP) according to this framing; unit costs for water purchased in 2019 are also shown.
 806

807 **Table 2. Program Controllable and Not Controllable Water Projects.**

Project	Score [AFY]	2019 Unit Cost [\$/AF]
Controllable – Storage		
Pathfinder EA + Lake McConaughy EA	70,000	N/A
NCCW (No Cost)	260	N/A
Pathfinder Municipal Account Lease	6,350	\$65.00
CNPPID Irrigator Lease ¹	1,900	\$293.33
CPNRD Canals Surface Water Lease	10,800	\$159.14
NPPD Canals Surface Water Lease	2,750	\$159.14
Subtotal =	92,060	
Controllable – Retiming		
Cook Recapture Well ²	160	\$52.90
Not Controllable – Retiming		
Tamarack I Groundwater Recharge ³	10,000	\$46.00
Phelps County Canal Recharge	2,700	\$31.91
Elwood Reservoir Recharge	2,800	\$48.46
CPNRD Canals Recharge	600	\$45.62
NPPD Canals Recharge	1,800	\$31.83
Broad-Scale Recharge ⁴	4,000	N/A
Subtotal =	21,900	
Total Score =	114,120	

808 ¹ The unit cost for the CNPPID irrigator lease is based on payment of \$220/acre for a yield of 9 inches per enrolled
 809 acre (0.75 AF/acre).

810 ² The unit cost for the Cook recapture well is based on payment for electricity to pump 25.57 AF in 2019.

811 ³ The unit cost for Tamarack I is based on the average annual cost for leases plus O&M (electricity).

812 ⁴ Construction of the Cottonwood Ranch broad-scale recharge project was completed in October 2019, but the
 813 project was not yet operational.
 814 .

815 The vast majority of controllable water supplies are those that are held in reservoir storage,
 816 mostly in the Lake McConaughy EA,²¹ with a very small contribution from the Cook recapture

²¹ Controllable storage water that accrues to the Pathfinder EA and Pathfinder Municipal Account is transferred to the Lake McConaughy EA in August-September each year.



817 well. The ability to control Program water supplies allows for targeted releases to reduce target
818 flows deficits, which results in controllable WAP projects having greater score efficiencies,²² or
819 to meet other specific habitat or species needs. Controllable supplies are expected to be a great
820 asset during the First Increment Extension for conducting necessary water-related science
821 experiments and supporting other elements of the Adaptive Management Plan.

822
823 All of the Program’s active groundwater recharge projects qualify as not controllable. While the
824 diversion of excess flows into the projects is controlled by the operators of those facilities, the
825 Program has no control over the physical processes of seepage and groundwater transport as
826 recharged water slowly migrates through the alluvial aquifer towards the river. Uncontrolled
827 accretions at the river from groundwater recharge will provide a low rate of continuous baseflow
828 returns for decades, regardless of whether the river is experiencing target flow shortages or
829 excesses in any given time period. Consequently, the score efficiencies of these projects are
830 much lower than the controllable counterparts,²³ and large volumes of water must be diverted
831 into recharge to achieve a reasonable score as a measure of target flow shortage reductions on an
832 annual average basis.

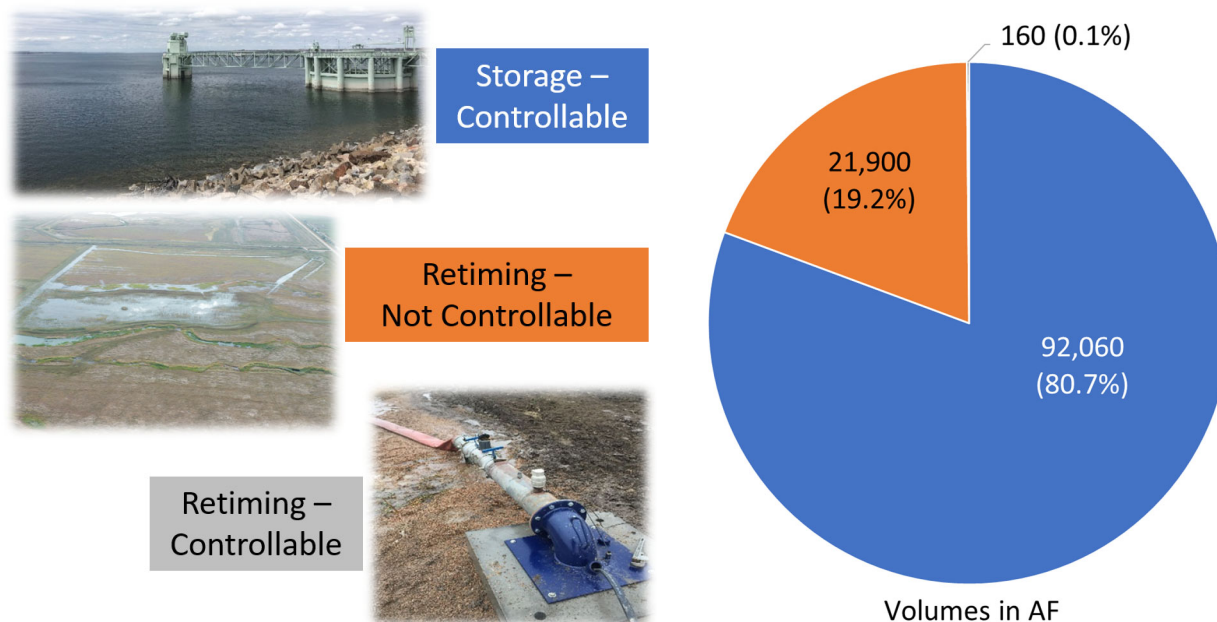
833
834 The unit costs shown in Table 2 also reflect the relative value of the different types of project
835 water, as the controllable supplies from surface water leases were generally much more
836 expensive than uncontrolled groundwater recharge.²⁴ **Figure 9** illustrates the proportions of
837 controllable and not controllable Program water projects.

838

²² Score efficiency is the proportion of water that a project adds to the river that contributes to the reduction of target flow shortages.

²³ Controllable recapture wells, which the Program can use to improve the efficiencies of recharge projects, are discussed in Section 5.2.1.

²⁴ In 2019, billing for CPNRD recharge was based on calculated accretions (return flows) at the river. The Phelps, Elwood, and NPPD recharge projects were billed based on amounts of excess flows diverted for recharge.



839
840 **Figure 9. Active Program Water Project Score Volumes, Controllable and Not**
841 **Controllable.**

842 **3.2 Future WAP Projects**

843 Potential future WAP projects identified as of late 2019 are summarized in **Table 3** below.

844

845 **Table 3. Potential Future WAP Projects.**

Project	Status	Estimated Score [AFY]
Nebraska Groundwater Recharge		
Recharge Recapture Well Field Project(s)	Pilot Project	8,000
Nebraska Water Leasing (Surface Water)		
CNPPID storage and/or NCCW lease	Conceptual	6,600
North Platte Irrigator/Irrigation District lease(s)	Conceptual	2,500
Other Projects		
Slurry Wall Gravel Pit storage	Design Final	2,800
Nebraska Water Management Incentives	Conceptual	N/A
Future Projects Total Score =		19,900

846
847 Collectively, the potential future WAP projects have estimated scores totaling nearly 20,000
848 AFY. This could push the cumulative score to about 134,000 AFY, but it is unlikely that all of
849 the potential future projects will be implemented, and scores that are eventually approved may
850 not be the same as current estimates. The first three projects listed in Table 3 will be discussed
851 further in the context of the next steps for achieving Milestone 4 and the water objective (**Section**
852 **5**).
853



854 Slurry wall gravel pit storage was another of the project concepts that emerged in 2016 as
855 alternatives to the J-2 Project that could be used for the retiming of excess flows. Common in
856 the South Platte Basin of Colorado but non-existent in Nebraska, these projects involve
857 reclaiming aggregate mine pits as below-grade reservoir storage by constructing an impermeable
858 barrier that surrounds the pit and isolates it from the surrounding alluvial aquifer.

859
860 In March 2017, a land acquisition opportunity emerged involving an existing sand and gravel
861 mine—located southwest of the Elm Creek interchange on Interstate 80—that was nearing
862 completion. Despite the uncertainties associated with a first of its kind project in Nebraska, the
863 GC recommended moving forward with a full-scale initial slurry wall gravel pit location at this
864 site (the EDO also presented pilot-scale options in other locations). The property known as
865 Lakeside was acquired, and contractor for engineering design was selected later in 2017. As the
866 design of the slurry wall gravel pit project advanced during the 2017-2019 period, the
867 construction costs kept increasing while the storage capacity and estimated score decreased. The
868 GC ultimately gave direction to complete the final design, which was done at the end of 2019,
869 but construction was not to proceed. For now the project is on hold, but if other combinations of
870 WAP projects are not able to meet the requirements of Milestone 4 and the First Increment water
871 objective, the Lakeside slurry wall gravel pit may be revisited in the future.

872
873 The Nebraska water management incentives project was originally presented in the 2000
874 Reconnaissance-Level WAP as options for changes in cropping and/or irrigation practices that
875 would result in reduced consumptive use. It was assumed that the irrigation supplies would be
876 from storage water and that the savings would be credited to the Lake McConaughy EA,
877 eventually resulting in increased river flows. The project was assigned a Tier II priority in the
878 2009 WAP Update, efforts were made to scope a feasibility study, and a workgroup of Water
879 Advisory Committee (WAC) members was established, but by 2012 the pursuit stalled, and
880 nothing was ever implemented. In 2017-2018, the water management incentives project was
881 briefly revived with the Program financially sponsoring efforts by the University of Nebraska
882 and other organizations to improve efficiencies in agricultural production. The goal remained
883 the same, to implement measures that would reduce irrigation consumptive use and improve
884 river flows. At the end of the First Increment, some form of the water management incentives
885 project remained a possibility for future implementation, but no specific opportunities were
886 identified.

887 **3.3 Inactive WAP Projects**

888 **Table 4** lists the WAP projects that were inactive at the end of the First Increment, along with
889 the project status given in previous WAP updates.

890
891



892 **Table 4. Inactive WAP Projects.**

Project	Project Status		
	2009	2014	2019
J-2 Regulating Reservoirs	Tier I	Tier I, Active	Inactive
Elm Creek Reregulating Reservoir	Tier I	Tier I, Inactive	Inactive
Glendo Reservoir Storage	Tier I	Tier I, Inactive	Inactive
Colorado Groundwater Management	Tier I	Tier I, Future	Inactive
NCCW (Purchased)	Tier I	Tier I, Inactive	Inactive
Nebraska Groundwater Management	Tier II	Tier II, Future	Inactive
Power Interference	Tier III	Tier III, Inactive	Inactive
Wyoming Water Leasing	Tier III	Tier III, Inactive	Inactive
LaPrele Reservoir	Tier III	Tier III, Inactive	Inactive
Acquire-and-Retire	N/A	N/A	Inactive

893
 894 As shown, nine of the 13 WAP projects originally assigned tiered priorities in the 2009 WAP
 895 Update were inactive by 2019, more than half of which were among the Program’s highest
 896 priority WAP projects early in the First Increment. Those projects were effectively eliminated
 897 for a variety of reasons as discussed in the sections below.

898 **3.3.1 Former Tier I Projects**

899 A key finding of the 2007-2008 WMS was the need for a reservoir near the upper end of the
 900 Program’s associated habitat reach to augment pulse flow releases. The J-2 Project soon
 901 emerged as the preferred alternative and progressed through the pre-feasibility, feasibility,
 902 conceptual design, and cost assessment stages of development by early 2013. In 2010, the
 903 project was also used as the case study for defining the methods and assumptions to be used for
 904 WAP project score analyses. Having the capacity to make major contributions to both pulse
 905 flow releases and target flow shortage reduction goals while remaining within the Program’s
 906 budgetary constraints, the J-2 Project was long the Program’s top priority WAP project pursuit.
 907 Engineering design of the reservoirs proceeded, along with requisite studies (geotechnical,
 908 environmental, cultural resources, etc.), permitting, and initial land acquisition efforts. All of
 909 this work ground to a halt in 2015 when an updated analysis indicated a near-tripling of
 910 construction costs. Over the next year, extensive efforts were made to devise a scaled-down J-2
 911 Project that could be built within the available budget, but those efforts were ultimately
 912 unsuccessful. By late 2016 the J-2 Project was on hold, and the GC gave direction to pursue
 913 other project alternatives.

914
 915 The concept for a new flood control reservoir on Elm Creek emerged from a study conducted for
 916 CPNRD in the mid-2000s. Additional feasibility-level analyses during 2009-2010 expanded the
 917 project scope to include potential target flow shortage reduction and SDHF augmentation
 918 benefits for the Program. Based on costs, the difficulty of delivering water to the reservoir, and a
 919 preference for the J-2 Project, the WAC and GC recommended that the Program not move
 920 forward with the Elm Creek Regulating Reservoir project.
 921



922 When the 2000 Reconnaissance-Level WAP was developed, it was assumed that a portion of the
923 Wyoming's storage water allocation in Glendo Reservoir²⁵ could be made available for Program
924 purposes. Instead, Wyoming needed that source of water for compliance with terms of the 2001
925 Modified North Platte Decree requiring mitigation of depletions between the Whalen Diversion
926 Dam and the Wyoming-Nebraska state line. The 2009 WAP Update speculated that since those
927 replacement water operations would conceptually increase flows relative to pre-1997 conditions,
928 there still might be some means for the Program to get some credit for that water, but that never
929 came to pass. As a Wyoming project, Glendo Reservoir storage was inactive at the end of the
930 First Increment, but as will be discussed in Section 5, the potential to lease some of Nebraska's
931 allocation in Glendo Reservoir from North Platte River irrigation districts is an ongoing pursuit
932 for possible future implementation.

933
934 Colorado groundwater management was a broad project concept that encompassed the Tamarack
935 III groundwater recharge project. Tamarack III was planned as an extension of the existing
936 Tamarack I and II projects,²⁶ which rely on a combination of dedicated recharge infrastructure
937 and surplus recharge credits leased from other water users in the lower South Platte Basin to
938 generate retimed accretions that benefit the Program and satisfy Colorado's depletions plan
939 obligations. While May-June accretions from the Tamarack projects continue to be adequate for
940 offsetting May-June river depletions attributable to post-1997 population growth in the South
941 Platte Basin, the average annual target flow shortage reductions attributable to Tamarack I during
942 the First Increment were less than the project's 10,000 AFY score credit. As explained in
943 Colorado's annual project reports,²⁷ the actual excess flows available for diversion by Tamarack
944 I in the winter months (December-March) of the First Increment years were much less than what
945 was anticipated based on the 1947-1994 historical period used for Program water projects
946 modeling and score analyses. Given this reality, there is no reason to expect that adequate water
947 supplies would be available for a Tamarack III project, and Colorado currently has no plans to
948 develop additional recharge capacity.

949
950 Section 3.1 noted that a very small portion (314 AFY) of the Tier I NCCW project that is
951 available to the Program at no cost each year remains active. A much larger volume of NCCW
952 was to be available for purchase by the Program as dictated by Article 402 of CNPPID's Federal
953 Energy Regulatory Commission (FERC) license for the Kingsley Dam Project (Project No.
954 1417-001), which states the following:

955
956 Upon implementation of a Program, the Licensee shall offer to the Program a quantity of
957 water equal to the estimated Net Controllable Conserved Water achieved by conservation
958 counted toward fulfilling the Licensee's obligations under the National Wildlife
959 Federation agreement but not funded by the U.S. Bureau of Reclamation, and shall assign

²⁵ Glendo Reservoir includes 40,000 AF available for irrigation, of which 15,000 AF is allocated to users in Wyoming and 25,000 AF is allocated to users in Nebraska.

²⁶ Tamarack I was Colorado's contribution to the Program's three initial state water projects, and Tamarack II was the name originally used for what is now Colorado's Plan for Future Depletions.

²⁷ Colorado's Tamarack I annual reports for the years 2013-2019 all include discussion of winter excess availability. In 2016, the EDO prepared an Excess Analysis White Paper that validated the conclusion that January-May excess flows during the First Increment were less than the 1947-1994 historical period, with the greatest deficits in February and March.



960 that quantity of water to the Environmental Account, provided that...the Program
961 purchases the water at a price equal to the average cost in 1997 dollars accrued by the
962 Licensee and/or its irrigation customers, as appropriate, in achieving that conservation.
963

964 The Program began working with CNPPID in 2009 to update costs, but it was apparent from the
965 start that costs would be much higher than the estimates in the 2000 Reconnaissance-Level WAP
966 (4,500 AFY for \$305,000 annually for 13 years, or about \$68/AF). Related analyses continued
967 for several years, and CNPPID made a series of offers for the Program to purchase NCCW in
968 2013. The final offer required pre-payment for 10,586 AFY for 25 years, through the end of
969 CNPPID's current FERC license term in 2038. Total upfront costs of nearly \$58 million were
970 not compatible with the Program's Water Plan budget, most of which was already dedicated to
971 the J-2 Project at that point. The offer was declined by the GC in December 2013, and the
972 project was considered inactive for the rest of the First Increment.

973 **3.3.2 Former Tier II Projects**

974 By the late 1990s, there was a large groundwater "mound" in the Central Platte region as a result
975 of decades of seepage from unlined surface water irrigation systems. Nebraska groundwater
976 management was a WAP project concept originally conceived to take advantage of high
977 groundwater levels as a source of supply. The 2000 Reconnaissance-Level WAP included a
978 generic Nebraska groundwater management project with four options such as active pumping
979 from high groundwater areas and switching from surface water to groundwater irrigation. That
980 plan also included the Dry Creek/Fort Kearny Cutoffs, which were essentially specific
981 applications of the active pumping concept within the Tri-Basin NRD. The "cutoffs" were small
982 ditches that would cross drainage boundaries to facilitate project water returns at river locations
983 farther upstream in order to benefit a larger segment of the associated habitat reach.
984

985 The drought of the early 2000s was followed by significant changes in irrigation practices. For
986 example, many of the earthen laterals in the CNPPID irrigation systems were lined or replaced
987 with buried pipe. Other irrigators converted from surface water to groundwater, as evidenced by
988 the changes that made the CPNRD and NPPD surface water leases possible. Consequently, the
989 excessive canal seepage that sustained the groundwater mound in earlier years began to diminish.
990 The 2009 WAP Update reported that the cutoff projects were no longer viable because "the
991 project's anticipated water source has decreased and the project focus changed." Other
992 groundwater management elements such as the active pumping of recharged water during target
993 flow shortages (i.e., recapture wells) were merged into the Nebraska groundwater recharge
994 concept.
995

996 At the time of the 2014 WAP Update, only Funk Lagoon remained as a potential groundwater
997 management project.²⁸ A feasibility study completed in 2015 determined that Funk Lagoon was
998 not a good option for either water storage (too much seepage) or groundwater recharge (seeps
999 too fast, groundwater gradient in the wrong direction). The WAC strongly recommended against

²⁸ The 2014 WAP Update also discussed a potential dewatering project with an individual landowner under the Phelps County Canal but said that the project was reviewed in 2012 and determined to be unfavorable.



1000 Funk Lagoon as a WAP project, after which no other groundwater management projects were
1001 considered.

1002 **3.3.3 Former Tier III and Other Inactive WAP Projects**

1003 Each of the three former Tier III projects (power interference, Wyoming water leasing, and
1004 LaPrele Reservoir) was originally introduced in the 2000 Reconnaissance-Level WAP, but no
1005 new information was ever developed or presented in one of the subsequent WAP updates. The
1006 projects remained perpetually inactive during the First Increment, and there were no plans for
1007 future pursuit after 2019.

1008
1009 The final inactive WAP project was a short-lived concept called “acquire-and-retire” that the
1010 Program tried to develop as a means to replace some of the score credit from the J-2 Project. For
1011 practical purposes, this project involved agricultural buy-and-dry without the negative
1012 connotations associated with that practice in Colorado. The idea was for the Program to
1013 purchase irrigated lands in Nebraska, sever the water from the land, and change the water rights
1014 to allow the consumptive use portion to be used for instream flows. To recoup some of the
1015 expenses, the Program planned to re-sell the land for dryland farming, which would help to
1016 minimize negative social and economic impacts to agricultural communities.

1017
1018 In mid-2016, the Program purchased a small irrigated parcel (about 30 acres of pasture grass)
1019 under the Alliance Canal near Bayard, Nebraska. Plans were made to continue irrigation for
1020 several years and install surface and groundwater monitoring equipment to collect data that
1021 would be used to quantify the transferable consumptive use. Initial steps were taken in this
1022 direction, and at the Program’s request, the irrigation district built a new check structure to better
1023 control flood irrigation from the lateral that crossed the property. Since the volume of water
1024 from the parcel was expected to be quite small, the Program attempted to acquire other nearby
1025 lands from which the transferable water supplies could be pooled together for eventual delivery
1026 to the Lake McConaughy EA, but these efforts were not successful. After considering the
1027 remote location of the lone acquire-and-retire property and the lack of legitimate prospects for
1028 expanding the project, the GC gave direction to sell the land. The sale was approved by the GC
1029 in late 2018 and finalized in 2019, effectively ending acquire-and-retire as a WAP project.

1030 **4 Lessons Learned**

1031 As demonstrated in the preceding sections, implementation of the WAP during the First
1032 Increment was a process of shifting priorities and approaches. The initial focus was on water
1033 projects that could both contribute significantly to target flow deficit reductions and supplement
1034 SDHF releases. Accordingly, top priority was given to the pursuit of a reservoir project in the
1035 Central Platte region that was below the North Platte chokepoint²⁹ and near the upper end of the

²⁹ The North Platte chokepoint is a reach of the North Platte river extending a few miles upstream and downstream of the Highway 83 bridge at North Platte, NE. The Program Document specifies a goal of achieving flows of 3,000 cfs through the chokepoint, while remaining below flood stage. However, the current estimated flow capacity at the minor flood stage of 6.0 ft is less than 2,000 cfs based on recent updates to the rating curve by NDNR. The idea behind a Central Platte reservoir was that it would have gates capable of releasing several thousand cfs to supplement releases from the Lake McConaughy EA that are constrained by the chokepoint.



1036 Program’s associated habitat reach. Despite the considerable efforts of Program staff,
1037 stakeholders, and outside consultants, the Program’s attempts to build new infrastructure projects
1038 met with limited success during First Increment. Over time, natural high flow events showed
1039 that SDHF were not likely to provide the expected habitat benefits,^{30,31} and several other WAP
1040 projects were implemented with a primary objective of reducing deficits to target flows.

1041
1042 All of these efforts by the Program to implement WAP projects during the First Increment
1043 required a great deal of adaptation and perseverance. Although early iterations of the WAP
1044 included fairly expansive lists of potential WAP projects, the status updates in Section 3 showed
1045 that all of the WAP projects active at the end of the First Increment could fit into just two main
1046 categories: surface water leasing and groundwater recharge (including recapture wells, which
1047 draw on the intentionally recharged groundwater). Through successes and failures, lessons were
1048 learned that will continue to guide the Program into and through the First Increment Extension.

1049 **4.1 New Infrastructure Projects**

1050 After investing significant resources in the study and design of a Central Platte reservoir over
1051 several years, changing economic conditions and escalating costs rendered the preferred J-2
1052 Project infeasible. This occurred in 2015, which was year nine of the 13-year First Increment.
1053 Up to that point, the Program was depending on the J-2 Project alone to provide more than 60
1054 percent of the score credit necessary to fulfill the intent of the WAP and achieve Milestone 4.
1055 An urgent effort began that was to find solutions to replace the J-2 Project. New project
1056 concepts—still with a primary emphasis on new infrastructure and storage—were developed that
1057 in combination appeared capable of generating the needed score credit. However, it was quickly
1058 recognized that it would not be possible to fully implement the projects within the span of the
1059 few remaining years of the First Increment; plans and processes to extend the First Increment
1060 were set in motion. The Program moved ahead with the simultaneous pursuit of both broad-scale
1061 recharge and slurry wall gravel pit storage projects, which were either entirely new ideas (the
1062 former) or in use elsewhere but untested in Nebraska (the latter).

1063
1064 Design and permitting for these new projects progressed, but slowly due to various issues arising
1065 from the unique nature of the projects. Property owned and/or managed by the Program at
1066 Cottonwood Ranch was available to use for the first broad-scale recharge project, but the
1067 extensive swaths of land that would need to be acquired—having both the characteristics
1068 necessary for effective recharge and accessibility for deliveries—limited prospects for more of
1069 these projects. The Program seized an opportunity to purchase an existing aggregate mine that
1070 was nearing completion but retrofitting the site as a slurry wall gravel pit when it was not
1071 planned for that purpose proved to be far more complicated and costly than anticipated.
1072 Delivering water to the site presented challenges, and the need to pump water out of a below-
1073 grade storage reservoir severely limited the project’s capacity to supplement environmental
1074 flows (SDHF or otherwise) or reduce target flow deficits. Ultimately, construction of the

³⁰ Jason M. Farnsworth, David M. Baasch, Patrick D. Farrell, Chadwin B. Smith, Kevin L. Werbylo. Investigating whooping crane habitat in relation to hydrology, channel morphology and a water-centric management strategy on the central Platte River, Nebraska. *Heliyon* 4 (2018) e00851.

³¹ 2019 State of the Platte. Prepared by the Executive Director’s Office of the Platte River Recovery Implementation Program.



1075 Cottonwood Ranch broad-scale recharge project was completed in 2019,³² but the GC elected to
1076 shelve the slurry wall gravel pit project in favor of less expensive WAP project options. Lessons
1077 learned through these processes include the following:

- 1078
- 1079 • Program policies specify acquisition of land from willing sellers, but new civil projects
1080 (e.g., reservoirs and pipelines) can be very difficult to construct without the ability to
1081 condemn land for easements and infrastructure. The Program does not have this
1082 authority, which imposes serious limitations on the scope and scale of new
1083 infrastructure projects.
 - 1084 ○ To elaborate, most civil infrastructure projects are undertaken by political
1085 subdivisions with power of eminent domain (including many PRRIP
1086 stakeholders represented on the GC). Those entities all follow a similar process
1087 starting with reconnaissance-level siting studies and progressing through
1088 increasingly detailed feasibility and design efforts. Land acquisition does not
1089 commence until siting is finalized and the design is advanced far enough to be
1090 sure of cost feasibility and land acquisition needs. At that point, acquisition
1091 negotiations proceed with the understanding that eminent domain may be used in
1092 cases where owners will not sell.³³
 - 1093 ○ The Program does not have power of eminent domain but First Increment
1094 attempts to develop infrastructure projects still followed the traditional study-
1095 design-acquire process. As a result, the Program invested heavily in engineering
1096 designs for projects only to be unable to secure the necessary land rights.
1097 Landowners were either uninterested in selling or were unwilling to sell at
1098 prevailing agricultural land value. The Program may have been able to purchase
1099 land at two to three times the assessed value but the Signatories determined
1100 purchases at multiples of assessed value to be politically unpalatable.
 - 1101 ○ In retrospect, lack of eminent domain necessitates a process more like private
1102 development. Private developers often purchase (or take an option) on land
1103 prior to project design, speculating that a feasible project will emerge after the
1104 land has been acquired. This approach was discussed with the GC but was not
1105 embraced as a number of stakeholders were hesitant to speculate with public
1106 money.
 - 1107 • Permitting can slow and extend project development time, especially if Federal permits
1108 are needed (e.g., Section 404 permits). Securing the necessary permits from Nebraska
1109 DNR can be understandably complicated for new project types for which there is little
1110 or no existing regulatory guidance.
 - 1111 • The amount of Program staff time needed through the entire process of developing an
1112 infrastructure project is easy to underestimate, even when using outside consultants for
1113 design and construction administration. Extensive time is required for all steps, from
1114 development of the Request for Proposals (RFP) through design (oversight of

³² Initial fill operations for the Cottonwood Ranch broad-scale recharge project were planned to take place in the summer of 2020, after vegetation is established on the berms, with regular spring-fall operations to begin in 2021.

³³ The exception in Nebraska is that eminent domain cannot be used to condemn/vacate road right-of-way so unwillingness to close or move roads can stop civil infrastructure projects.



1115 consultants, design reviews, costs, etc.) and on to construction (oversight of both design
1116 consultants and building contractors, billing, coordinating with neighboring landowners,
1117 etc.). Additional staff time is needed to oversee operations and monitoring of completed
1118 projects.
1119 • On the ground realities at a project site can require expensive adjustments to the design.
1120 Weather can cause costly delays during construction.
1121

1122 Though the design, permitting, and construction processes can be arduous, the upside of new
1123 infrastructure is that the Program controls most or all aspects of the completed project rather than
1124 being dependent on the existing infrastructure and operations of partner districts or other entities.

1125 4.2 Surface Water Leases

1126 Volumetrically, surface water represented the major portion of the Program’s water portfolio at
1127 the end of the First Increment. Much of that comes from natural inflows to the Lake
1128 McConaughy EA and Pathfinder EA that were established as part of the Program’s initial state
1129 water projects, but more than 20,000 AF of approved and estimated score credit was derived
1130 from a variety of surface water leases. All of the Program’s leased surface water eventually ends
1131 up in the Lake McConaughy EA. The Pathfinder Municipal Account lease was long planned as
1132 part of Wyoming’s Pathfinder Modification Project, and it was implemented as soon as project
1133 construction was completed and the water became available.³⁴
1134

1135 Other surface water leases took advantage of changes in irrigation practices after the drought of
1136 the early- to mid-2000s. Large numbers of irrigators under the CPNRD and NPPD canal systems
1137 converted to groundwater sources, and the relinquished surface water³⁵ was made available for
1138 leasing by the Program. As discussed in Section 3.1.1.2, the original tactic of returning surface
1139 water leased from the CPNRD canals directly to the river during the irrigation season was an
1140 inefficient means of meeting the Program’s target flow shortage-reduction objectives. Having
1141 learned this lesson after a few years of project operations, the project was reconfigured to credit
1142 the leased water to the Lake McConaughy EA. This required the cooperation of several Program
1143 partners (CPNRD, CNPPID, and Nebraska DNR) and demonstrated the advantages of working
1144 together towards common goals with mutual benefits to the partners and the Program. Still, the
1145 more important lesson is to recognize the value in continuing to review WAP projects after they
1146 are implemented in order to know how and when operations or other aspects need to be modified
1147 to best meet Program goals. After the new approach proved to be successful, a functionally
1148 identical project to lease relinquished surface water from NPPD canals was implemented.
1149

1150 The CNPPID irrigator lease represents another permutation of surface water leasing from
1151 agricultural sources, with a very important distinction: CPNRD and NPPD irrigators
1152 relinquished surface water, but that was a result of switching to groundwater for irrigation
1153 supplies. There was essentially no change in production for these irrigators other than the
1154 change in sources, which happened independently of Program activities. CNPPID irrigators who

³⁴ A leasing contract between the Program and the Wyoming Water Development Office was signed in 2011, and the first water deliveries occurred in 2012.

³⁵ Specifically, the historical consumptive use component of the natural flow surface water rights.



1155 participate in the lease program specifically forego production of an irrigated crop on the
1156 enrolled lands for that year. The price paid by the Program for this water is meant to compensate
1157 for the reduced or lost crop yields when the land is dryland farmed or fallowed, respectively.
1158 Lessons learned through the implementation of the CNPPID irrigator lease include the following:
1159

- 1160 • The farmlands under the CNPPID canals (Phelps County Canal, E-65 Canal, and E-67
1161 Canal) have been continuously irrigated since the early 1940s. It is difficult for a
1162 comparatively new entity such as the Program to break into entrenched systems with
1163 entrenched practices, particularly if the objective is to remove water from agricultural
1164 production and use it for other purposes such as to benefit fish and wildlife.
- 1165 • Consequently, the Program needed to provide a financial incentive to participate. The
1166 initial unit cost was set high (\$220/acre) to entice participation in a new and unfamiliar
1167 leasing program. Skepticism on the part of irrigators resulted in enrollment during the
1168 first year (2016) of little more than half of the acreage allowed under the original leasing
1169 agreement (1,037 out of 2,000 acres). However, the irrigator lease quickly caught on and
1170 by the fourth year (2019), maximum enrollment was nearly achieved at an even higher
1171 level (2,934 out of 3,000 acres).
- 1172 • Agricultural market conditions are an important factor for a project such as the CNPPID
1173 irrigator lease. Irrigators need to consider the financial aspects of growing a crop versus
1174 leasing the water instead. Compared to just a few years before, corn prices since the
1175 inception of the CNPPID irrigator lease have been relatively low, which has perhaps
1176 helped irrigators to better understand the value of water as a “crop.” At the same time,
1177 normal to wet hydrologic conditions and precipitation during many of those years also
1178 allowed for very good yields from dryland crops, essentially providing two revenue
1179 streams for those farmers who chose to go that route.
- 1180 • While it was necessary to incentivize participation at the start of the CNPPID irrigator
1181 lease, the high unit cost for this project (effectively \$293/AF) may have created
1182 unrealistic expectations for leasing other surface water from agricultural sources. This
1183 lesson was noted by WAC members interviewed by the EDO to gather feedback for this
1184 report, who commented that the unit costs paid for surface water may have opened too
1185 wide, and the Program must now try to reign those in to reflect actual on the ground
1186 costs.³⁶
1187

1188 Surface water leases were integral to Program activities during the First Increment and may
1189 become even more so in the future. As the prospects for successfully developing multiple new
1190 infrastructure projects dwindled, and other new project concepts such as acquire-and-retire were
1191 attempted without success, the focus of WAP project pursuits shifted again during the final years
1192 of the First Increment. Efforts to prioritize contributions to the Lake McConaughy EA were

³⁶ The unit cost for Pathfinder Municipal Account lease water was \$51/AF for the first 38,400 AF during the First Increment, then increased to \$65/AF. The new contract extending that project for the duration of the First Increment Extension (2020-2032) fixes the cost at \$65/AF for the entire period. Surface water leased from CPNRD was subject to an annual price escalator, which was 3% during the final years of the First Increment. The price for that water reached \$159.14/AF in 2019, and the same price was applied to NPPD surface water for the first year of that pilot exchange project in 2019. For 2020, the unit cost for both CPNRD and NPPD surface water was negotiated down to \$90/AF. The cost for the CNPPID irrigator lease was to remain \$220/acre (\$293/AF) in 2020, but the lease agreement includes the option to adjust that cost through an annual pricing addendum.



1193 renewed, and as controlled storage, this water can be released as needed to reduce target flow
1194 deficits through the associated habitat reach and will be vital to Adaptive Management Plan flow
1195 experiments during the First Increment Extension.

1196
1197 With this emphasis on controllable water supplies comes the need for careful management of
1198 both EA releases and surface water lease projects that are credited to the EA to avoid negative
1199 consequences from unforeseen circumstances. For example, flooding and ice jams on the Platte
1200 River and tributaries downstream of the Program’s associated habitat reach in late winter 2019
1201 precluded typical EA releases for the spring whooping crane migration and channel maintenance.
1202 These events also prevented the Program from proceeding with a planned flow test on the North
1203 Platte River during the late spring or summer of 2019. Higher storable natural inflows and WAP
1204 project contributions to the EA, combined with an inability to make releases for much of the
1205 year, resulted in the EA volume exceeding 180,000 AF (more than 90 percent of the 200,000 AF
1206 capacity) by May 2020. If releases had been limited for a second year in a row, there was a
1207 significant risk of losing Program water if the EA had exceeded capacity or if Lake McConaughy
1208 reached effective capacity and forced a reset of the account to 100,000 AF.

1209 **4.3 Groundwater Recharge**

1210 The expansion of the Nebraska groundwater recharge WAP project concept was described in
1211 Section 3.1.1.1., illustrating how a successful pilot project starting with just the Phelps County
1212 Canal was scaled up to encompass separate projects at five other Central Platte canals, a
1213 reservoir, broad-scale recharge, and recapture wells. All of the canal and reservoir recharge
1214 projects utilize existing irrigation facilities owned and operated by Program stakeholder entities,
1215 which is advantageous in light of the many obstacles to building new infrastructure.

1216
1217 At the same time, this factor greatly limits Program control of these projects. The Program does
1218 not have standing and is thus reliant on those partners to secure the necessary permits from
1219 Nebraska DNR to divert excess flows for recharge; for all except the CPNRD canals (Thirty
1220 Mile, Cozad, and Orchard-Alfalfa), this remains an annual requirement. Program staff can set
1221 the hydrologic condition, monitor the availability of excess flows, and coordinate plans for
1222 recharge, but the actual operations to start or stop diversions are still subject to approval by
1223 Nebraska DNR and dependent on the partner districts to carry them out. Even the newly
1224 constructed Cottonwood Ranch broad-scale recharge project, for which the Program will control
1225 on-site operations, is still dependent on CNPPID to deliver water to the project via a pipeline
1226 from the Phelps County Canal.

1227
1228 Not only does the Program generally lack control over recharge projects, but the projects are
1229 inefficient.³⁷ Subject to hydrologic conditions (i.e., normal to wet years) and availability, large

³⁷ Inefficiency in this context means that on an average annual basis, a recharge project’s contribution to the reduction of target flow shortages is a relatively small percentage of the total volume of water that the project returns to the river each year because accretions (return flows) from recharge occur continuously during both shortages and excesses. Total annual accretions are also generally much smaller than the water volumes purchased by the Program and diverted into the projects. Stated another way, recharge project inputs are greater than recharge project returns, which are greater than the target flow shortage reductions attributable to recharge projects. In contrast, releases of leased surface water from the Lake McConaughy EA can be controlled to maximize shortage reductions, and thus those projects can be said to have much higher efficiencies.



1230 volumes of excess flows can be diverted for recharge in any given year, but it takes years or
1231 decades for that water to migrate back to the river. This is a function of both aquifer properties
1232 and distance from the river. Uncontrolled accretions to the river occur continuously at a low rate
1233 of flow regardless of whether the river has target flow shortages or excesses.³⁸ The consistent
1234 baseflow contributions are certainly beneficial to the ecosystem, but recharge projects are not
1235 providing significant contributions to reducing large deficits and cannot substantially enhance
1236 high flow releases.

1237
1238 Paradoxically, recharge projects are dependent on opposite hydrologic conditions for optimal
1239 performance: wet years with abundant excess flows are best for diverting new water into the
1240 canals and reservoirs to then seep into the aquifer, and dry years with low streamflows allow for
1241 more extensive contributions to shortage reductions. Nonetheless, recharge projects do provide
1242 some measure of target flow shortage reductions each year and thus do generate score credit for
1243 the Program, but the annual amounts on average can be small compared to the volumes of water
1244 diverted into the projects. The long response times, inefficiencies, and generally uncontrolled
1245 nature of recharge projects are reflected in the costs paid for the water, which are much less than
1246 what is paid for controllable surface water.

1247
1248 The Phelps County Canal and NPPD (Gothenburg and Dawson County canals) recharge projects
1249 are billed on the basis of measured diversions or net recharge³⁹ of excess flows. Even with built-
1250 in annual cost escalators, the unit cost for both projects remained below \$32/AF in 2019.
1251 CPNRD recharge water was more expensive (\$45.62/AF in 2019) because billings were based on
1252 smaller volumes of calculated accretions from current and past years' recharge operations rather
1253 than the volumes diverted at the canal headgates each year. This approach was advantageous to
1254 CPNRD in 2018 and 2019 when there were few or no new diversions of excess flows but
1255 accretions from earlier recharge continued. However, the inconsistent approaches to reporting
1256 and billing complicated Program efforts to complete accounting analyses and other evaluations
1257 of what are essentially functionally identical projects utilizing six different existing canals for
1258 recharge purposes.

1259
1260 New WSAs extending these projects a few years into the First Increment Extension established
1261 common unit costs (starting at \$32.87/AF in 2020, to increase by 3% per year thereafter) and
1262 reporting metrics⁴⁰ (measured diversions or net recharge). Elwood Reservoir seepage is
1263 somewhat different than the canal projects in that the unit cost paid by the Program (\$48.46/AF
1264 in 2019) is higher still because of the need to pump all diverted water into the reservoir⁴¹ and

³⁸ Controllable recapture wells, which the Program can use to improve the efficiencies of recharge projects, are discussed in Section 5.2.1.

³⁹ Net recharge = measured diversions – measured spills or tailwater returns

⁴⁰ Starting in 2020, CPNRD and NPPD will both bill for net recharge as defined above. CNPPID measures Phelps County Canal diversions with a flume at Mile Post 1.6, and the canal is checked at Mile Post 13.3 during recharge operations. Phelps recharge often occurs beneath an ice cap on the canal during the winter, and there is essentially no need to account for spills or surface returns. If there is water remaining in the canal at the end of recharge operations that has not yet seeped, CNPPID will deduct that volume from the measured diversions that are billed. When doing the project accounting calculations, the EDO also estimates the canal seepage that occurs between the headgates and the measurement flume.

⁴¹ In contrast, canal recharge is entirely driven by gravity.



1265 because of the opportunity cost of diverting that water off of the main CNPPID Tri-County
1266 Supply Canal upstream of the two Johnson hydropower plants.⁴²

1267
1268 With multiple active projects, large volumes of water were diverted into recharge in 2015 and the
1269 next few years, all of which experienced normal to wet hydrologic conditions in the Central
1270 Platte region. However, initial accounting analyses indicate that comparatively little of that
1271 water returned to the river in those early year of project operations, and much of what did return
1272 was not during shortage periods. As discussed in the 2018 PRRIP Water Projects Accounting
1273 Memo, this was partly a function of time, in that the returns will accrue over decades and the
1274 projects had simply not operated long enough to achieve the steady state returns that will occur
1275 after years of consistent operations. Distance was also a factor, as the largest volumes of
1276 recharge water were diverted into Elwood Reservoir, which also happens to be much farther
1277 away from the Platte River than other recharge areas.

1278
1279 This large volume of water stored in the aquifers, particularly on the south side of the river,
1280 presents an opportunity for further adaptation of Program recharge projects: recapture wells.
1281 The idea is that recapture wells can pump recharged groundwater directly to the river only during
1282 periods of shortage, thereby improving the efficiency of the parent recharge projects, i.e., larger
1283 percentages of both the annual return flows and the original excess flows that were diverted will
1284 achieve the desired purpose of reducing target flow shortages.

1285
1286 A single recapture well was installed on the Program’s Cook property in 2016 to draw on water
1287 recharged through Phelps County Canal. Pumping was limited during the first years of
1288 operations due to wetter conditions and a relative lack of shortage periods but is expected to
1289 increase should a dry spell occur during the coming years of the First Increment Extension. At
1290 the end of the First Increment, the Program began developing conceptual plans for a larger
1291 network of recapture wells to pump from the large reserve of recharged groundwater resulting
1292 from multiple projects that contribute seepage to aquifers under the jurisdiction of the Tri-Basin
1293 Natural Resources District (TBNRD). More about this future WAP project is provided in
1294 Section 5.

1295 **5 Next Steps**

1296 The previous sections of this report described progress towards implementation of the WAP
1297 during the First Increment—what projects were pursued and when, where did the Program find
1298 success and where did it not, how did the plan itself evolve over time—and the lessons that were
1299 learned through those efforts. This section outlines the plan moving forward into the First
1300 Increment Extension, including the path to achieving cumulative score credit of 120,000 AFY or
1301 greater and the specific projects that are likely to be pursued to help reach that goal. Plans to use
1302 the Program’s portfolio of water projects to conduct experiments under the Adaptive
1303 Management Plan are also discussed.

1304

⁴² Phelps County Canal diverts just above the river return from the CNPPID system, downstream of the Johnson hydropower plants.



1305 **5.1 The Path to 120,000 AFY**

1306 Table 1 and Figure 8 in Section 3 show the status of approved and estimated scores for the
1307 Program’s active water projects as follows:

- 1308
- 1309 • Initial State Water Projects = 80,000 AFY
- 1310 • Active WAP Projects with Approved Scores = 14,170 AFY
- 1311 • Active WAP Projects with Estimated Scores = 19,950 AFY
- 1312

1313 With a combined score estimate of 114,120 AFY at the end of the First Increment, an additional
1314 5,880 AFY is needed to achieve the stated goal⁴³ of reaching 120,000 AFY as quickly as possible
1315 during the First Increment Extension. Table 3 in Section 3 identifies the following potential
1316 future WAP projects and score estimates:

- 1317
- 1318 • Recapture wells = 8,000 AFY
- 1319 • North Platte Irrigator/Irrigation District Lease(s) = 2,500 AFY
- 1320 • CNPPID storage lease = 6,600 AFY
- 1321

1322 The total score from these projects is estimated to be 17,100 AFY, which is nearly triple the
1323 amount needed to reach 120,000 AFY. This provides the Program with some flexibility,
1324 particularly if the eventual approved scores for those projects currently estimated are less than
1325 expected or if any currently active WAP projects are terminated. The combination of these three
1326 potential future projects also represents a pathway to 130,000 AFY if the additional 10,000 AFY
1327 is determined to be necessary to achieve target species management objectives.

1328 **5.2 Planned and Potential Future Projects**

1329 The following sections provide additional details on the planned and potential future WAP
1330 projects.

1331 **5.2.1 Recapture wells**

1332 Recharge projects generally provide steady baseflow returns to the Platte River over periods of
1333 years to decades. As a result, a portion of the return flows from these projects reaches the river
1334 at times of excess to target flows, providing little or no benefit to the river as defined in the
1335 context of the Program’s water objectives. Recapture wells are a means of increasing the
1336 efficiency of recharge projects by controlling the timing at which recharge return flows reach the
1337 river. The recapture wells can be operated specifically when there are deficits to target flows,
1338 thereby improving the operational score credit for the Program.

1339
1340 The Program’s analysis of operational score improvements associated with recapture wells
1341 considers the timing and location of recharge and recapture facilities, the availability of return
1342 flows over time, the volumes of water that are delivered to the river via the recapture wells, and
1343 the delayed impacts of the pumping on the river. These analyses will be ongoing to show that

⁴³ Addendum to the Program Document – First Increment Extension, Section II.B. Water Plan, second bullet point.



1344 the combined effects of recharge return flows, pumping deliveries, and lagged depletions from
1345 that pumping consistently result in net positive benefits to the river. As discussed previously, a
1346 well was installed on the Program’s Cook property with the goal of pumping during periods of
1347 shortage to recapture groundwater that was intentionally recharged in the Phelps County Canal.
1348 That recapture well provided a “proof of concept” and has operated successfully since 2016.

1349
1350 In 2019, the Program began developing a pilot project for a larger network of recapture wells to
1351 be located in the vicinity of Cottonwood Ranch. This project will be a partnership with the
1352 TBNRD and will initially draw on the significant volumes of water recharged through the Phelps
1353 County Canal and Elwood Reservoir during the First Increment. Program accounting analysis
1354 showed that the cumulative volume recharged in the Phelps County Canal from the start of pilot
1355 operations in 2011 through the end of calendar year 2018⁴⁴ was 29,300 AF.⁴⁵ Of that total
1356 recharge volume, 19,400 AF returned to the river as baseflow accretions and 330 AF was
1357 pumped by the Cook well. That leaves (through 2018) a balance of 9,570 AF remaining in
1358 “storage” in the aquifer.

1359
1360 The 2018 PRRIP Water Projects Accounting memo⁴⁶ summarized Elwood Reservoir recharge as
1361 follows:

1362
1363 Of the 44,300 AF diverted into Elwood Reservoir for the Program by the end of calendar
1364 year 2018, approximately 25,000 AF had seeped from the reservoir as groundwater
1365 recharge, 2,300 AF was lost to evaporation, and 17,000 AF remained in storage in the
1366 reservoir itself. Of the total seepage volume, 4,200 AF had returned to the Platte River as
1367 lagged accretions, and the balance of 20,700 AF either migrated towards the Republican
1368 River or remained in aquifer storage en route to the Platte River.

1369
1370 Elwood Reservoir sits atop a groundwater divide between the Platte River and Republican River
1371 basins. In the score analysis for Elwood recharge,⁴⁷ it was estimated that about 76% of
1372 recharged water would eventually return to the Platte River, and the rest would end up in the
1373 Republican River basin to the south. Applying that percentage to the 25,000 AF total recharge
1374 from Elwood Reservoir (through 2018) would indicate 19,000 AF will return to the Platte River.
1375 With 4,200 AF of lagged accretions to the Platte River having already occurred, then an
1376 estimated 14,800 AF remains in the aquifer.

1377
1378 The reservoir also still held 17,000 AF of recharge water, of which as much as 12,920 AF (76%)
1379 could be destined for the Platte River (minus some additional evaporation losses from the
1380 reservoir surface). In total, about 37,000 AF was diverted for recharge in the Phelps County
1381 Canal and Elwood Reservoir but had not yet returned to the Platte River as baseflow accretions

⁴⁴ WAP projects accounting for 2019 has not yet been completed.

⁴⁵ The calculated volume of recharge exceeds the volume invoiced by CNPPID. For accounting purposes, the EDO also estimates seepage from the Phelps County Canal between the headgate and the MP 1.6 measurement flume.

⁴⁶ PRRIP Executive Director’s Office. 2018 PRRIP Water Projects Accounting. Memo to PRRIP Water Advisory Committee, Final, August 27, 2019.

⁴⁷ PRRIP Executive Director’s Office. Elwood Reservoir Groundwater Recharge Scoring Analysis. Memo to PRRIP Scoring Subcommittee, Final, September 17, 2019.



1382 by the end of 2018, thus representing a substantial volume available for withdrawal by future
1383 recapture wells. Phelps and Elwood recharge operations will continue during the First Increment
1384 Extension, and once the Cottonwood Ranch broad-scale recharge project begins regular
1385 operations, that water will also be available to recapture.

1386
1387 The pilot project currently in development would include the installation of seven recapture
1388 wells on Program land at Cottonwood Ranch or nearby private lands, with the wells collectively
1389 having an estimated score of up to 1,500 AFY. Under an agreement with TBNRD, the Program
1390 will pay for the initial construction and annual operations and maintenance for the new recapture
1391 wells. Installation is anticipated to be completed in 2021. If the pilot project is successful, it
1392 may be scaled up in the future; assuming a consistent score for each well, 40 or more additional
1393 recapture wells may be required to achieve a total project score of 8,000 AFY.

1394 **5.2.2 North Platte leases**

1395 The 1953 Order Modifying and Supplementing Decree of October 8, 1945 allocated 40,000 AF
1396 of storage water in Glendo Reservoir for irrigation purposes. This water was divided, with
1397 15,000 AFY for irrigation in southeastern Wyoming downstream of Guernsey Reservoir, and
1398 25,000 AFY for irrigation in that portion of western Nebraska within the North Platte River
1399 basin. The 2001 North Platte River Settlement resulted in further modifications to the original
1400 decree. Appendix C of the Final Settlement Stipulation is the Amendment of the 1953 Order to
1401 Provide for Use of Glendo Storage Water. Paragraphs 2 and 5 are of particular interest for
1402 Program purposes:

1403
1404 2. With Glendo Reservoir storage supplies, each state may substitute or supplement
1405 quantities of storage water obtained under other contractual arrangements. Subject to
1406 contractual arrangements with the United States Bureau of Reclamation, including any
1407 required Endangered Species Act and NEPA compliance, **each state shall also enjoy**
1408 **unrestricted use of its respective storage allocation in Glendo Reservoir so long as**
1409 **the use is below Glendo Reservoir and within the Platte River Basin.**

1410
1411 **5. Storage water in Glendo Reservoir from either state's allocation may be used for**
1412 **fish and wildlife purposes downstream of Glendo Reservoir under contractual**
1413 **arrangements with the United States Bureau of Reclamation,** subject to approval of
1414 Wyoming for contracts for water from Wyoming's storage allocation and subject to
1415 approval of Nebraska for contracts for water from Nebraska's storage allocation. **Any**
1416 **water released pursuant to such an agreement shall not be considered natural flow**
1417 **but shall be administered and protected as storage water in accordance with state**
1418 **law within both Wyoming and Nebraska until used for its intended purposes.**
1419 (emphasis added)

1420
1421 In simpler terms, there is a storage water account in Glendo Reservoir historically designated for
1422 irrigation that can now be used for fish and wildlife purposes anywhere in the Platte River basin
1423 downstream of Glendo Reservoir, and releases of that water are to be administered and protected
1424 as storage water as it flows downstream to the place of use for such purposes.



1425 As described in the 2000 Reconnaissance-Level WAP and discussed in Section 3.3.1 of this
 1426 report, the original Tier I Glendo Reservoir Storage WAP project was based on the premise that
 1427 a portion of Wyoming’s 15,000 AF allocation would be available for leasing by the Program, but
 1428 the project did not come to fruition because Wyoming needed the water for other mitigation
 1429 purposes. That project having long been deemed inactive, the more recent pursuit of a portion of
 1430 Nebraska’s Glendo Reservoir storage allocation is considered to be part of a Nebraska water
 1431 leasing strategy focused on the North Platte River.

1432
 1433 Four Nebraska entities have long-term contracts with the U.S. Bureau of Reclamation for a
 1434 portion of the state’s 25,000 AF allocation of Glendo Reservoir storage water, as shown in **Table**
 1435 **5**.

1436
 1437 **Table 5. Contracts for Nebraska’s Glendo Reservoir storage water.**

District	Contractual Amount [AF]
Enterprise Irrigation District	3,000
Mitchell Irrigation District	12,000
Bridgeport Irrigation District	2,000
Central Nebraska Public Power and Irrigation District	8,000
TOTAL =	25,000

1438
 1439 In 2015, Program staff began researching the viability of leasing Glendo storage water from
 1440 users in Nebraska, and in 2019, the Program initiated informal discussions with representatives
 1441 of the Enterprise Irrigation District (Enterprise) regarding a potential lease of the district’s
 1442 Glendo storage water. Enterprise currently has a 2009 contract with the U.S. Bureau of
 1443 Reclamation (USBR) for 3,000 AFY for a term of 40 years. The contract restricts the water to
 1444 irrigation use on the district’s lands, but other provisions of the contract and the specific terms of
 1445 the 2001 North Platte River Settlement described above suggest that leasing the water for
 1446 Program purposes should be feasible.

1447
 1448 Specifically, Subarticle 3.d. of the Enterprise contract with USBR provides for 90 percent (2,700
 1449 AF)⁴⁸ of the district’s portion of the Glendo water supply to be paid for as needed during the
 1450 irrigation season, with a significant caveat:

1451
 1452 Provided, however, that if during any year of the term of this Contract, the United States
 1453 should receive a firm offer or offer from a third party or parties, to purchase during such
 1454 year, all, or a part of the remainder of the Contractor’s portion of the Glendo Water
 1455 Supply for that year, then after written notice by the Secretary to the Contractor, the
 1456 Contractor will either agree to pay for the remaining water supply for that year, or pay for

⁴⁸ Subarticle 3.c. of the contract requires payment for the initial 10 percent (300 AF) of Enterprise’s portion of the Glendo water supply on or before May 1.



1457 such part as the Contractor desires to retain...and release to the United States as much of
1458 said water supply as the Contractor does not desire to retain.
1459

1460 Based on this contract language, the Program should be able to make an offer to USBR to
1461 purchase at least 2,700 AF of Enterprise's Glendo water in any given year. If Enterprise does
1462 not intend to utilize the Glendo water, all or a portion would be released to USBR, which retains
1463 the actual ownership of the water, and USBR would in turn lease that water to the Program.
1464 Leased Glendo water could then be delivered for storage in the Lake McConaughy EA until it is
1465 needed for Program purposes. If the full 3,000 AFY could be leased, the estimated score would
1466 be on the order of 2,500 AFY.
1467

1468 Although Enterprise does not own water rights for the Glendo storage water, the district has had
1469 contracts for it since the 1950s. The Program does not have data indicating how frequently
1470 Enterprise has actually taken delivery of Glendo water since that time, but the district regards it
1471 as an important reserve supply in dry years. Any contract for the Program to lease Glendo water
1472 would be with USBR, but Program staff believe it is in the interest of the Program's good
1473 neighbor policy that Enterprise should be compensated if the district is to relinquish a portion of
1474 their water supply. One possible means of compensation would be for the Program to provide
1475 financial support for much-needed repairs within the Enterprise irrigation system.
1476

1477 To that end, Program Special Advisor Anderson Consulting Engineers completed a review of
1478 critical structures in the Enterprise irrigation system and estimated rehabilitation costs in late
1479 2019. The study found that the structures most in need of repair are the diversion dam, the
1480 headgates, and the flow measurement device. There are not yet any specific details of a potential
1481 lease arrangement between the Program and USBR and/or Enterprise, but this and possibly other
1482 leases from Glendo or other North Platte River sources will be a high priority WAP project
1483 pursuit for the Program in the early years of the First Increment Extension.

1484 **5.2.3 CNPPID storage lease**

1485 The 2009 WAP Update reported that the NCCW in Lake McConaughy available for purchase by
1486 the Program ranged from 7,151 AFY to 10,586 AFY. As documented in the 2014 WAP Update
1487 and discussed in Section 3.3.1 of this report, the GC declined a series of offers to purchase
1488 NCCW from CNPPID in 2013 due to high unit costs and required advance payment in full for 25
1489 years of water deliveries, and that portion of the NCCW project was deemed inactive for the
1490 remainder of the First Increment.
1491

1492 Subsequently, an alternative proposal was developed for a CNPPID storage water lease from
1493 appropriation A-2374 in Lake McConaughy, but formal action was never taken. The 2014 WAP
1494 Update described this as a future Nebraska Water Leasing project with an estimated maximum
1495 volume of 5,000 AFY and an annual average of 3,900 AFY. It was noted that "some of the
1496 water for this lease could come from, though may not necessarily come from, water that was
1497 available for the NCCW option."
1498



1499 In 2018, new terms were proposed for the amount of water available each year under an NCCW
1500 or CNPPID storage lease, which would be variable as a function of the total storage volume in
1501 Lake McConaughy:

- 1502
- 1503 a. If total storage contents in Lake McConaughy on October 1 equals or exceeds 1,200,000
1504 acre-feet, the available water amount shall be 10,586 acre-feet.
 - 1505 b. If total storage contents in Lake McConaughy on October 1 is less than 1,200,000 acre-
1506 feet, but equals or exceeds 1,000,000 acre-feet, the available water amount shall be 8,000
1507 acre-feet.
 - 1508 c. If total storage contents in Lake McConaughy on October 1 is less than 1,000,000 acre-
1509 feet but equals or exceeds 800,000 acre-feet, the available water amount shall be 6,000
1510 acre-feet.
 - 1511 d. If total storage contents in Lake McConaughy on October 1 is less than 800,000 acre-feet,
1512 or if CNPPID’s Board of Directors has determined by October 1 that there will be less
1513 than a full water delivery allocation for CNPPID’s irrigation customers, regardless of
1514 storage contents in Lake McConaughy, the available water amount shall be zero acre-
1515 feet.
- 1516

1517 The estimated score of 6,600 AFY for a CNPPID storage lease project is derived from a rough
1518 score analysis using modeled Lake McConaughy storage volumes for the period 1947-1994 and
1519 the water availability terms specified above. As of late 2019, the Program and CNPPID had not
1520 reached any agreement for long-term implementation of a storage lease, but the project remains
1521 feasible and may be pursued if needed during the First Increment Extension.

1522 **5.3 Nebraska grand water bargain**

1523 Late in the First Increment, Nebraska DNR and a group of Program stakeholders began
1524 negotiating a plan—informally referred to as the “Nebraska grand water bargain”—that would
1525 provide regulatory certainty and funding for Program water obligations far into the future. The
1526 plan encompasses a collection of active and potential future WAP projects in Nebraska,
1527 including groundwater recharge and storage water contributions to the Lake McConaughy EA:

- 1528
- 1529 • Groundwater recharge
 - 1530 ○ CPNRD and NPPD canals
 - 1531 ○ CNPPID system projects (Phelps County Canal, Elwood Reservoir, and
 - 1532 Cottonwood Ranch broad-scale recharge)
 - 1533 ○ Recapture wells pilot project and potential future expansion
 - 1534 • Storage water
 - 1535 ○ CPNRD and NPPD surface water leases
 - 1536 ○ Unspecified additional water that could come from leases from North Platte
 - 1537 irrigation district(s), CNPPID storage leases, or other sources not yet identified.
- 1538

1539 In terms of regulatory certainty, the grand water bargain would replace the annual pilot exchange
1540 projects for the CPNRD and NPPD surface water leases with long-term agreements, although the
1541 annual volumes of water available from those projects may shift somewhat over time. With the



1542 exception of the CPNRD canals, all other recharge projects were required to apply for temporary
1543 annual permits from Nebraska DNR; the grand water bargain may include permanent permits for
1544 those recharge diversions.

1545
1546 The negotiating parties have not agreed to the specific terms of such an arrangement, but in
1547 concept, the Program would make a large lump sum payment into an endowment that would
1548 provide funding to purchase water and continue operations of these projects for an extended
1549 period well beyond the First Increment.

1550 **5.4 Water Plan tasks for the First Increment Extension**

1551 The Nebraska grand water bargain is expected implemented by 2022. If this happens, the
1552 inclusion of the recapture wells, North Platte irrigation district leases, and/or the CNPPID
1553 storage lease would immediately result in a cumulative water projects score exceeding 120,000
1554 AFY, at least on paper (additional time would likely be required to bring all of the component
1555 projects online and complete score analyses). However, if the Nebraska grand water bargain
1556 does not succeed, the Program will still need to negotiate long-term agreements for individual
1557 WAP projects such as the CPNRD and NPPD surface water leases. The current WSAs for
1558 several recharge projects are set to expire between 2023 and 2025, and those will need to be
1559 renegotiated to ensure continuation of the projects at least through the scheduled end of the First
1560 Increment Extension in 2032.

1561
1562 With development of the pilot scale recapture wells network already underway and plans to
1563 diligently pursue North Platte irrigation district leases in the early years of the First Increment
1564 Extension, the Program would most likely still be on track to reach at least 120,000 AFY no later
1565 than 2025. The Addendum to the Program Document⁴⁹ defines the water-related tasks that are to
1566 be undertaken after this goal is achieved:

- 1567
- 1568 • The Program is committed to achieving the minimum water milestone of 130,000 acre-
1569 feet in annual reductions to target flow shortages. However:
 - 1570 ○ The Program recognizes there are fiscal constraints to achieving this milestone,
1571 and
 - 1572 ○ Scientific investigations need to be completed to confirm the need for 130,000
1573 acre-feet in annual reductions to target flow shortages.
 - 1574 • The Program will invest the resources available to achieve at least 120,000 acre-feet in
1575 annual reductions to target flow shortages as quickly as possible during the Extension
1576 and will also invest in the science necessary to determine if the additional 10,000 acre-
1577 feet is justified.
 - 1578 • The Program is committed to finding the additional resources necessary to achieve that
1579 additional 10,000 acre-feet if justified by the science.
- 1580
1581

⁴⁹ Addendum to the Program Document – First Increment Extension, Section II.B. Water Plan.



1582 In order to accomplish these tasks, the Program must also do the following:

1583

1584 • Design, construct, and implement Water Action Plan (WAP) projects in time to enable
1585 scientific evaluation prior to the end of the Extension term.

1586 • Renew water project agreements as deemed necessary to achieve water milestone.

1587

1588 Program water management activities during the First Increment Extension will be closely
1589 coordinated with the Adaptive Management Plan in order to ensure that the required scientific
1590 investigations are completed in an appropriate and effective manner. As noted in Section 3.1.3,
1591 the shift that occurred late in the First Increment to prioritize controllable water supplies,
1592 particularly those that can be held in the Lake McConaughy EA, will be instrumental to the
1593 successful completion of these tasks.



Appendix A

PRRIP Water Milestone Update Memo (October 4, 2019)



1 **TO:** PRRIP WATER ADVISORY COMMITTEE
2 **FROM:** PRRIP EXECUTIVE DIRECTOR’S OFFICE
3 **SUBJECT:** PRRIP WATER MILESTONE UPDATE
4 **DATE:** OCTOBER 4, 2019

5
6
7 **I. STATUS OF WATER MILESTONE**
8

9 This memorandum provides an overview of the progress made by the Platte River Recovery
10 Implementation Program to achieve the Water Milestone (Milestone #4). Milestone #4 is
11 specifically related to the Water Action Plan (WAP) and is stated as follows, per the Program
12 Milestones Document¹:

13
14 “The [2000] Reconnaissance-Level Water Action Plan, as may be amended by the
15 Governance Committee, will be implemented and capable of providing at least an
16 average of 50,000 acre-feet per year of shortage reduction to target flows, or for other
17 Program purposes, by no later than the end of the First Increment.”
18

19 The Explanatory Material and Schedules section of the Milestones Document identifies seven
20 steps that “are necessary to implement the [Program] Water Plan and are needed to successfully
21 complete Milestone 4.” While these steps provide guidance, they are not to be considered as
22 individual milestones for purposes of Endangered Species Act compliance. The steps are listed
23 below, along with their respective status updates as of late 2019.
24

25 **Milestone Step 4.1: Ongoing**
26

27 “The Governance Committee is responsible for allocating funds necessary to implement
28 the [2000] Reconnaissance-Level Water Action Plan in accordance with the Program
29 budget, as approved by the signatories and may be revised by the Governance
30 Committee.”
31

32 **Milestone Step 4.2: Ongoing**
33

34 “The Governance Committee is responsible for acquiring the necessary permits for
35 individual water related activities and for insuring compliance with all relevant local,
36 state and federal laws and regulations.”
37

38 **Milestone Step 4.3: Ongoing**
39

40 “The Governance Committee will determine which projects in the [2000]
41 Reconnaissance-Level Water Action Plan are retained through the reconnaissance,
42 feasibility, and implementation level. Water related activities implemented in accordance

¹ Program Document, Attachment 2



43 with the Water Plan will be credited to the Program’s long-term objective as set forth in
44 the Platte River Recovery Implementation Program, Section III.A.3.a.(1) and the
45 objective for the First Increment of the Program. As appropriate, the Governance
46 Committee will develop and use protocols to determine what quantities of water will be
47 credited to the individual projects.”
48

49 The Program operated in compliance with these three steps during the First Increment from 2007
50 to the present. Funding and permitting requirements were satisfied as needed by the Governance
51 Committee (GC). Many projects were evaluated through the feasibility level, and several were
52 carried forth to the implementation level. In addition, the GC accepted a set of general
53 assumptions to estimate the quantity of water credited to the Program’s milestone from an
54 implemented WAP project, which is referred to as the project score. **Appendix A** provides the
55 generally accepted methodology used to score WAP projects and the assigned project scores as
56 of October 2019.

57
58 **Milestone Step 4.4: Completed**

59
60 “Recognizing that the initial [2000] Reconnaissance –Level Water Action Plan
61 (Attachment 5, Section 6 [of the Program Document]), is based on reconnaissance level
62 project evaluations, the Governance Committee will complete feasibility studies on
63 proposed projects and develop a Water Action Plan, if necessary, by the end of Year 3 of
64 the First Increment [2009].”
65

66 The Program completed several feasibility studies to advance projects, such as the J-2 Regulating
67 Reservoirs, Elm Creek Reregulating Reservoir and the Phelps County Canal Groundwater
68 Recharge project. The Program also completed a 2009 WAP Update, in compliance with the
69 specification that this be done by the end of Year 3 of the First Increment. A 2014 WAP Update
70 provided further progress updates related to the 2000 Reconnaissance-Level WAP projects and
71 new projects under consideration.
72

73 **Milestone Step 4.5: Ongoing**

74
75 “This Water Action Plan, as may be amended by the Governance Committee, will be
76 capable of providing at least an average of 25,000 acre-feet per year of shortage reduction
77 to target flows, or for other Program purposes, by the end of Year 8 of the First Increment
78 [2014].”
79

80 **Scored WAP Projects 2007 through 2014 (First Increment Year 1 to Year 8)**

81 The Program successfully achieved this goal by implementing or initiating negotiations for
82 implementation for the following projects by the end of Year 8: J-2 Regulating Reservoirs²,
83 Phelps County Canal Groundwater Recharge³, and the Pathfinder Municipal Account Lease⁴.

² EDO 2012

³ EDO 2013

⁴ EDO 2014



84 The GC originally accepted scores for these three projects totaling 36,400 acre-feet per year
 85 (AFY) of deficit reduction relative to U.S. Fish and Wildlife Service (USFWS) target flows.
 86 Scored WAP Projects 2015 through 2019 (First Increment Year 9 to Year 13)
 87 Unanticipated and significant increases in the costs for materials and construction of the J-2
 88 Regulating Reservoirs project were presented to the GC in September 2015. Following more
 89 than a year of unsuccessful attempts to develop a workable reduced-capacity version of the
 90 project, the previously accepted score of 30,600 AFY was retracted pending resolution of a hold
 91 placed on the project by the GC in November 2016. New and updated WAP project scores
 92 accepted by the GC since 2016 are shown in Table 1.

93
94

Table 1. WAP Project Scores Accepted 2016-2019

Project	Score [AFY]	Date Accepted
No-Cost Net Controllable Conserved Water (NCCW) ⁵	260	March 2016
Phelps County Canal Groundwater Recharge + Cook Recapture Well ⁶	2,860	September 2016
Pathfinder Municipal Account Lease ⁷	6,350	September 2018
CNPPID Irrigator Lease ⁸	1,900	June 2019
Elwood Reservoir Groundwater Recharge ⁹	2,800	September 2019
TOTAL	14,170	

95
 96 The Program’s share of the Phelps County Canal Groundwater Recharge project was increased
 97 from 50 percent (1,800 AFY) to 75 percent (2,700 AFY) when the GC approved a Water Service
 98 Agreement (WSA) reflecting the modified allocation and in conjunction with the score analysis
 99 for the Cook Recapture Well. The score analysis for the Pathfinder Municipal Account Lease
 100 was updated to better reflect actual operational yields, and the GC accepted a revised score of
 101 6,350 AFY, an increase of 2,350 AFY over the original 4,000 AFY score. The combined total of
 102 active project scores accepted by the GC was 14,170 AFY as of October 2019 (Year 13 of the
 103 First Increment).

104

Unscored WAP Projects in Various Stages of Development or Implementation

105 Since the start of Year 9 of the First Increment, the Program entered into WSAs to continue or
 106 initiate the leasing of surface water from several stakeholder districts or the diversion of excess
 107 flows for groundwater recharge. Active projects that have not been scored yet, but provide an
 108 annual yield for the Program include the following:

109

- Central Platte Natural Resources District (CPNRD) WSA for diversion of excess flows for groundwater recharge during the non-irrigation season, ongoing since 2013, and the leasing of surface water from the Thirty Mile, Cozad, and Orchard-Alfalfa canals. From 2015-2017, leased surface water was measured and returned to the river at the canal

110
111
112
113
114

⁵ EDO 2016a
⁶ EDO 2016b
⁷ EDO 2018a
⁸ EDO 2019a
⁹ EDO 2019b



115 headgates during the irrigation season. These were normal to wet years with fewer days
116 of shortage, which significantly limited the operational yield (i.e., actual shortage
117 reduction at Grand Island) of the project compared to the large volumes of water leased.
118 In 2018, a pilot exchange project was initiated to instead credit that surface water to the
119 Lake McConaughy EA following the end of the irrigation season. This retooled approach
120 to the surface water lease was continued in 2019.

- 121 • Nebraska Public Power District (NPPD) WSA for excess flow deliveries into the
122 Gothenburg and Dawson County canals for recharge operations, ongoing since 2015.
- 123 • NPPD WSA for a surface water exchange from the Gothenburg and Dawson County
124 canals to be credited to the Lake McConaughy EA following the irrigation season,
125 initiated in 2019.

126
127 Since September 2015, the EDO has actively pursued the development and implementation of
128 new project concepts, initially to supplement a reduced-capacity J-2 Regulating Reservoirs
129 project and eventually to replace that project entirely. These new projects, including broad-scale
130 recharge, slurry wall gravel pits, and the acquisition and retirement of irrigated farmland
131 (“acquire & retire”) were not included in any of the previous Water Action Plan documents.

132
133 The new project concepts were critical components of the Water Plan A and B options presented
134 to the GC in July 2016. These revised water plans demonstrated that the shortage reduction goal
135 of Milestone #4 (50,000 AFY) could still be successfully achieved with smaller or no J-2
136 Regulating Reservoirs. The EDO presented a further-refined Water Projects Work Plan to the
137 GC in March 2017, which showed that projects with combined scores exceeding 40,000 AFY
138 could be developed by 2025 (Year 6 of a proposed First Increment Extension). The 40,000 AFY
139 is consistent with current plans to achieve 120,000 AFY of target flow deficit reductions as
140 quickly as possible during the First Increment Extension.

141
142 In March 2017, a contractor was selected for engineering design and construction administration
143 of the first broad-scale recharge project, to be developed at the Program’s Cottonwood Ranch
144 complex. A pipeline will deliver divertible excess flow water from the Phelps County Canal to
145 Cottonwood Ranch. Construction of the project began in October 2018 and is expected to
146 conclude in October 2019. Recharge operations will commence in 2020, once vegetation is
147 established on the berms that retain water to create the recharge ponds.

148
149 Following a recommendation from the GC to pursue development of a full-scale storage facility,
150 the Lakeside gravel pit located southwest of Elm Creek and adjacent to other Program properties
151 was selected for the initial slurry wall storage project and acquired by the Program in 2017.
152 Engineering design of the slurry wall and other facilities was completed in 2019. Given the high
153 construction cost estimates, a comparatively small anticipated project score, and lower-cost
154 alternatives with higher expected yields, the GC decided not to proceed with permitting and
155 construction of the project until such time that the project is deemed necessary to meet the First
156 Increment Water Objective.

157
158 The Program’s first acquire & retire transaction was completed for a property under the Alliance
159 Irrigation District near Bayard, Nebraska in September 2016. Preliminary efforts to quantify the



160 volume of transferable consumptive use water were made, but the GC gave direction for the
161 property to be sold in 2018, and the sale was completed in 2019. The acquire & retire concept
162 was abandoned as a source of water for the WAP in favor of additional water leasing pursuits
163 that could contribute to the Lake McConaughy EA.

164
165 Estimated scores for the five projects that are currently active, but for which score analyses have
166 not yet been completed as of September 2019 are shown in Table 2.

167
168 **Table 2. Estimated scores for other active WAP projects**

Project	Estimated Score [AFY]
CPNRD groundwater recharge (Thirty Mile, Cozad, Orchard-Alfalfa canals)	600
CPNRD surface water lease	10,800
NPPD groundwater recharge (Gothenburg and Dawson County canals)	1,800
NPPD surface water lease	2,750
Cottonwood Ranch broad-scale recharge	4,000
TOTAL	19,950

169
170 The combined estimated score for all active WAP projects is 34,120 AFY. At this time, it is
171 anticipated that the remaining water required to meet Milestone #4 will come from some
172 combination of (1) a well field to recapture groundwater intentionally recharged through the
173 Phelps County Canal and Elwood Reservoir; (2) leases of surface water from Nebraska irrigators
174 or irrigation districts along the North Platte River upstream of Lake McConaughy; and/or (3)
175 leasing of conserved water stored in Lake McConaughy from the CNPPID.

176
177 **Milestone Step 4.6: Ongoing**

178
179 “The Governance Committee will ensure that projects implemented under this Water
180 Action Plan are operated in accordance with approved operating plans and that they are
181 having the intended effects on Program purposes.”

182
183 **Milestone Step 4.7: Ongoing**

184
185 “The Governance Committee will ensure that water produced by projects implemented
186 under this Water Action Plan is included in approved tracking and accounting procedures
187 and that these projects are coordinated with other Program activities including other
188 water projects and with the management of the Environmental Account.”

189
190 The Program actively operated and managed WAP projects in compliance with the specifications
191 of these milestone steps through 2019. Annual reports for the Phelps County Canal Groundwater
192 Recharge Project were prepared for the 2012-2013 through 2016-2017 recharge seasons.
193 Accounting procedures for other WAP projects were developed and refined between 2017 and
194 2019. The 2018 PRRIP Water Projects Accounting memo¹⁰ documented project operations and

¹⁰ EDO 2019c



195 accounting through the end of that calendar year, including comparison of operational yields
196 versus approved scores.

197

198 II. FEASIBILITY STUDIES AND EVALUATIONS

199

200 The following project feasibility studies and other evaluations have been completed to further
201 WAP projects and Milestone #4:

202

- 203 • Water Management Study Phases I and II: Evaluation of Pulse Flows for the Platte River
204 Recovery Implementation Program (2008)¹¹
- 205 • Platte River Recovery Implementation Program 2009 Water Action Plan Update (2010)¹²
- 206 • Nebraska Ground Water Recharge Pre-Feasibility Study (2010)¹³
- 207 • CNPPID Reregulating Reservoir: Elwood and J-2 Alternatives Analysis Project Report
208 (2010)¹⁴
- 209 • Canal Winter Operations Feasibility Study (2011)¹⁵
- 210 • Feasibility Study – Elm Creek Regulatory Reservoir (2011)¹⁶
- 211 • CNPPID J-2 Reregulating Reservoir Feasibility Report (2012)¹⁷
- 212 • Pilot-Scale Recharge Report for Nebraska Groundwater Recharge Feasibility Study
213 (2012)¹⁸
- 214 • Conceptual Design Report: J-2 Regulating Reservoir Project (2013)¹⁹
- 215 • Platte River Recovery Implementation Program 2014 Water Action Plan Update (2015)²⁰
- 216 • Funk Lagoon Feasibility Study (2015)²¹
- 217 • Water Leasing White Paper (2015)²²
- 218 • Broad-Scale Recharge Summary of Concept, Work Completed, and 2016 Work Plan
219 (2016)²³
- 220 • Broad-Scale Recharge Status Update (2016)^{24,25}
- 221 • Conceptual Example of Slurry Wall Gravel Pits for PRRIP (2016)²⁶
- 222 • Update on Slurry Wall Gravel Pits for PRRIP (2016)²⁷

¹¹ Boyle Engineering Corporation et al. 2008a,b

¹² EDO and WAC 2010

¹³ EDO et al. 2010

¹⁴ Olsson Associates and Black & Veatch 2010

¹⁵ Applegate Group, Inc. 2011

¹⁶ Olsson Associates 2011

¹⁷ Olsson Associates and Black & Veatch 2012

¹⁸ EA Engineering, Science, and Technology, Inc., and Daniel B. Stephens and Associates, Inc. 2012

¹⁹ RJH Consultants, Inc. 2013

²⁰ EDO and WAC 2015

²¹ EDO 2015a

²² EDO 2015b

²³ EDO 2016c

²⁴ EDO 2016d

²⁵ EDO 2016e

²⁶ EDO 2016f

²⁷ EDO 2016g



- 223 • Program Water Plan – Plan A and Plan B (2016)²⁸
- 224 • Osborne Property Status and Work Plan (2016)²⁹
- 225 • Water Action Plan Project Status and Scores (2017)³⁰
- 226 • Water Action Plan Projects Update (2017)³¹
- 227 • Water Action Plan Project Status and Scores (2018)³²
- 228 • Water Action Plan Projects Status and Scores (2019)³³

229

230 Projects that were not recommended to move forward into implementation include the Elm
231 Creek Reregulating Reservoir, the For-Purchase NCCW project, the Glendo Reservoir storage
232 project, and the Funk Lagoon as a Nebraska Groundwater Management project, as discussed
233 below:

234

- 235 • Elm Creek Reregulating Reservoir: The GC agreed not to move forward with the Elm
236 Creek Reregulating Reservoir at the June 2011 meeting, as the J-2 Regulating Reservoir
237 was the preferred reservoir site.
- 238 • For-Purchase NCCW: Consistent with its FERC license obligation, the CNPPID made
239 an initial offer to the Program on March 4, 2013 with subsequent offers made on
240 September 5, 2013 and December 2, 2013 (final offer) for the For-Purchase NCCW. The
241 GC did not accept the terms of the final offer at the December 2013 meeting due to the
242 high unit cost and the required upfront payment for the total volume of water purchased
243 through 2038. However, as discussed in the 2014 WAP Update, “conserved water
244 retained in the CNPPID’s account in Lake McConaughy could be a source of water for a
245 storage lease with the CNPPID.”
- 246 • Glendo Reservoir storage: Wyoming’s allocation of Glendo storage water is needed to
247 meet all or a portion of the replacement water obligations described below; therefore,
248 Wyoming’s allocation of Glendo storage water is no longer directly available for
249 Program uses. The Final 2001 Settlement Stipulation for the Nebraska v. Wyoming
250 lawsuit modified the original 1945 North Platte Decree (as amended in the 1953
251 Modified Decree), and the provisions in the stipulation (Exhibits 10 and 11) required
252 Wyoming to provide replacement water for depletions to the North Platte River from
253 wells and tributaries from the Whalen Diversion Dam to the state line reach.
- 254 • Funk Lagoon: The EDO completed a feasibility of the site as a WAP project and
255 presented the results to the WAC at the October 2015 meeting. The WAC recommended
256 the Program not pursue the project and the GC was updated on the feasibility study
257 results at the December 2015 meeting.

258

259 These projects are regarded as inactive for the remainder of the First Increment for budgetary or
260 other reasons but could be reevaluated if conditions change.

²⁸ Kenny and EDO 2016

²⁹ EDO 2016h

³⁰ EDO 2017a

³¹ EDO 2017b

³² EDO 2018b

³³ EDO 2019d

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APPENDIX A: ACCEPTED ASSUMPTIONS AND SCORES

The GC approved a set of scoring assumptions recommended by the Scoring Subcommittee in 2010. The methodology was used to score the J-2 Regulating Reservoir (two-cell concept), the Phelps County Canal Groundwater Recharge project, the Pathfinder Municipal Account Lease, the No-Cost Net Controllable Conserved Water project and the Cook Tract Recapture project. The key assumptions are listed in **Table A-1**. **Table A-2** provides a list of projects scored to-date, as recommended by the Scoring Subcommittee and assigned by the GC.

Table A-1. Key scoring assumptions for WAP projects, accepted by the GC.

Component	Data
Hydrology	OpStudy Adjusted Present Condition with Three State Projects (without pulse flows)
Analysis Period	1947-1994
Analysis Time Step (A)	Daily or Monthly
Excesses/Shortages Calculation	Calculated at Grand Island
Target Flows	Appendix A-5, Column 4 or 8 in the Water Plan Reference Materials of the Program Document
Routing (B)	WMC Loss Model

Notes:

- (A) The scoring of project yields against USFWS shortages is completed on a monthly basis for most projects; however, the J-2 Regulating Reservoir project was completed on a daily time step.
- (B) The WMC Loss Model was updated in the Water Management Study Phase I (2008) by Boyle Engineering Corporation. It was originally developed by the Program’s Water Management Committee, as required by milestone W14-1 of the Cooperative Agreement.



Table A-2. Project scores assigned by the GC.

WAP Project	Program Score (AFY)	Approval Date	Notes
J-2 Regulating Reservoir	30,600	Mar-2012; RETRACTED Nov-16	The GC approved a score of 30,600 AFY at the March 2012 GC meeting for an assumed 75% of the project (assuming the NDNR would receive 25%). The score is based on a two-cell reservoir concept with a capacity of 13,959 AF, with "Area 2" unavailable for Program uses during the irrigation season due to the CNPPID's hydrocycling mitigation activities. This project was placed on hold by the GC in November 2016. The assigned score was retracted, pending resolution of the hold.
Phelps County Canal Groundwater Recharge	2,700	Dec-13; Sep-16	The GC approved a score of 1,800 AFY at the December 2013 meeting for an assumed 50% of the project (assuming the NDNR would receive 50%). The Phelps recharge score was increased from 1,800 AFY to 2,700 AFY to represent the draft permanent agreement with the CNPPID of 75% of deliveries to the Program (25% to the NDNR). The GC approved the score update in September 2016 in conjunction with the Cook recapture well score.
Cook Tract Recapture Project	160	Sep-16	A recapture well was constructed on the Cook tract to route recharged water (from the Phelps County Canal) to the river more quickly during USFWS target flow shortages. A score of 160 AFY was approved by the GC in September 2016.
Pathfinder Municipal Account Lease	6,350	Mar-14; Sep-18	The GC approved a score of 4,000 AFY at the March 2014 meeting , based on 4,800 AF available in Pathfinder Reservoir each year (the total volume is 38,400 AF per the agreement with the Wyoming Water Development Commission). The GC approved an updated score of 6,350 AFY in September 2018 based on analyses revised to better reflect actual operations and the regular availability of additional water from the Pathfinder Municipal Account.
No-Cost Net Controllable Conserved Water (NCCW)	260	Mar-16	Each year 314 AF are added to the Lake McConaughy Environmental Account at no cost to the Program. The GC approved a score of 260 AFY at the March 2016 meeting.
CNPPID Irrigator Lease	1,900	Jun-19	The GC approved a score of 1,900 AFY at the June 2019 meeting , based roughly on 2019 project enrollment of 2,948 acres (out of max 3,000 acres) and yield of 9 inches per acre (0.75 AF/acre).
Elwood Reservoir Groundwater Recharge	2,800	Sep-19	The GC approved a score of 2,800 AFY at the September 2019 meeting , based on maximum annual recharge of 30,000 AF, a 5,600 AFY total score, and 50% allocation to the Program.
TOTAL PROGRAM SCORE FOR ACTIVE PROJECTS	14,170		Total scored projects yielding water; does not include J-2 Regulating Reservoir



Appendix B

PRRIP Water Objective Summary (September 2019)

PRRIP Water Objective Summary (December 2019)



WATER OBJECTIVE SUMMARY

SEPTEMBER 2019

During the First Increment of the Platte River Recovery Implementation Program (Program), progress toward the Program objectives for Endangered Species Act (ESA) compliance purposes are measured through the achievement of Milestones. The Program’s First Increment Water Objective is to achieve at least an average of 130,000 AF per year of shortage reduction to target flows. The three initial state projects (Pathfinder Reservoir Environmental Account, Lake McConaughy Environmental Account, and Tamarack I) were credited with providing the first 80,000 AF of shortage reduction. Milestone #4 calls for implementation of the Water Action Plan (WAP) to provide additional shortage reduction of at least 50,000 AF. The following tables summarize Program progress towards meeting the First Increment Water Objective and associated milestone.

EXISTING WATER PROJECTS

PROJECT	SCORING STATUS	SCORE (AF)	EST. COST (2018-2032)	NOTES	CUMULATIVE SCORE (AF)	CUMULATIVE COST (\$M)
EA Storable Natural Inflow	Complete					
Pathfinder Modification	Complete	80,000	\$-		80,000	\$0.00
Tamarack I	Complete					
No-Cost NCCW	Complete	260	\$-		80,260	\$0.00
Pathfinder Municipal	Complete	6,350	\$7,170,000	Score approved 9/2018. Cost reflects avg releases.	86,610	\$7.20
NPPD Groundwater Recharge	Estimated	1,800	\$2,312,000		88,410	\$9.50
Phelps County Recharge	Complete	2,860	\$1,606,000	Includes costs and score for Cook recapture well	91,270	\$11.10
CPNRD Groundwater Recharge	Estimated	600	\$1,130,000		91,870	\$12.20
Elwood Recharge	In Progress	2,800	\$8,165,000	Scoring Subcommittee recommended score	94,670	\$20.40
Cottonwood Ranch BSR	Estimated	4,000	\$10,000,000	Will be refined when operational data available	98,670	\$30.40
CPNRD Surface Water Transfer	Estimated	10,800	\$21,142,000	Reflects lower cost during Extension	109,470	\$51.50
CNPPID Irrigator Lease	Complete	1,900	\$9,532,000	Score approved 6/2019.	111,370	\$61.00
NPPD Surface Water Transfer	Estimated	2,750	\$3,932,000	Based on 3,121 AF max annual transfer	114,120	\$64.90
	TOTALS	114,120	\$64,989,000			



POTENTIAL FUTURE WATER PROJECTS

PROJECT	PROJECT STATUS	EST. SCORE (AF)	EST. COST (2018-2032)	STATUS	CUMULATIVE SCORE (AF)	CUMULATIVE COST (\$M)
Recharge Recapture Project(s)	Conceptual	8,000	\$7,000,000	Conceptual design. Implementation in 2020	122,120	\$71.90
North Platte Irrigator Lease(s)	Conceptual	2,500	\$5,900,000	Preliminary discussions	124,620	\$77.80
Lakeside Gravel Pit	Final Design	2,800	\$10,000,000	Final design	127,420	\$87.80
CNPPID NCCW Lease	Conceptual	6,600	\$8,991,000	Preliminary discussions	134,020	\$96.80
TOTALS		19,900	\$31,891,000			

COMBINED EXISTING AND FUTURE WATER PROJECT SCORE AND COST ESTIMATE

	SCORE (AF)	ESTIMATED COST (2018-2032)
EXISTING WATER PROJECTS	114,120	\$64,989,000
POTENTIAL FUTURE WATER PROJECTS	19,900	\$31,891,000
	134,020	\$96,880,000
APPROXIMATE 2018 - 2032 WATER BUDGET		\$85,000,000



WATER OBJECTIVE SUMMARY

DECEMBER 2019

During the First Increment of the Platte River Recovery Implementation Program (Program), progress toward the Program objectives for Endangered Species Act (ESA) compliance purposes are measured through the achievement of Milestones. The Program’s First Increment Water Objective is to achieve at least an average of 130,000 AF per year of shortage reduction to target flows. The three initial state projects (Pathfinder Reservoir Environmental Account, Lake McConaughy Environmental Account, and Tamarack I) were credited with providing the first 80,000 AF of shortage reduction. Milestone #4 calls for implementation of the Water Action Plan (WAP) to provide additional shortage reduction of at least 50,000 AF. The following tables summarize Program progress towards meeting the First Increment Water Objective and associated milestone.

EXISTING WATER PROJECTS

PROJECT	SCORING STATUS	SCORE (AF)	EST. COST (2020-2032)	NOTES	CUMULATIVE SCORE (AF)	CUMULATIVE COST (\$M)
EA Storable Natural Inflow	Complete	80,000	\$-		80,000	
Pathfinder Modification	Complete					
Tamarack I	Complete					
No-Cost NCCW	Complete	260	\$-		80,260	
Phelps County Recharge	Complete	2,860	\$2,086,000	WSA through 2023. Includes Cook recapture well.	83,120	
Pathfinder Municipal	Complete	6,350	\$8,112,000	Lease contract through 2032.	89,470	
Elwood Recharge	Complete	2,800	\$11,695,000	WSA through 2023.	92,270	
CNPPID Irrigator Lease	Complete	1,900	\$8,710,000	Lease agreement through 2023.	94,170	
NPPD Groundwater Recharge	Estimated	1,800	\$2,567,000	WSA through 2025.	95,970	
CPNRD Groundwater Recharge	Estimated	600	\$2,567,000	WSA through 2024.	96,570	
Cottonwood Ranch BSR	Estimated	4,000	\$10,000,000	Construction complete, operations to begin 2020.	100,570	
CPNRD Surface Water Lease	Estimated	10,800	\$TBD	Pilot exchange in 2018 and 2019.	111,370	
NPPD Surface Water Lease	Estimated	2,750	\$TBD	Pilot exchange in 2019.	114,120	
	TOTALS	114,120	\$TBD			\$TBD



POTENTIAL FUTURE WATER PROJECTS

PROJECT	PROJECT STATUS	EST. SCORE (AF)	EST. COST (2020-2032)	STATUS	CUMULATIVE SCORE (AF)	CUMULATIVE COST (\$M)
Recharge Recapture Project(s)	Conceptual	8,000	\$7,000,000	Conceptual design. Nebraska DNR may develop.	122,120	
North Platte Irrigator Lease(s)	Conceptual	2,500	\$TBD	Preliminary discussions	124,620	
Lakeside Gravel Pit	Final Design	2,800	\$12,000,000	Final design	127,420	
CNPPID NCCW Lease	Conceptual	6,600	\$TBD	Preliminary discussions	134,020	
TOTALS		19,900	\$TBD			\$TBD

COMBINED EXISTING AND FUTURE WATER PROJECT SCORE AND COST ESTIMATE

	SCORE (AF)	ESTIMATED COST (2018-2032)
EXISTING WATER PROJECTS	114,120	\$TBD
POTENTIAL FUTURE WATER PROJECTS	19,900	\$TBD
	134,020	\$TBD
APPROXIMATE 2020 - 2032 WATER BUDGET		\$TBD



Appendix C

PRRIP Water Action Plan Projects Status and Scores Memo (October 4, 2019)



TO: PRRIP WATER ADVISORY COMMITTEE
FROM: PRRIP EXECUTIVE DIRECTOR’S OFFICE
SUBJECT: PRRIP WATER ACTION PLAN PROJECTS STATUS AND SCORES
DATE: OCTOBER 4, 2019

The Platte River Recovery Implementation Program (PRRIP or Program) has a water objective of reducing deficits to U.S. Fish and Wildlife Service (USFWS)-defined target flows by 130,000 to 150,000 acre-feet per year (AFY) by the end of the Program’s First Increment in 2019. The three initial state projects—the Pathfinder Modification Environmental Account (EA) in Wyoming, Tamarack I in Colorado, and the Lake McConaughy EA in Nebraska—collectively meet 80,000 AFY of that objective. The Program was tasked with implementing a Water Action Plan (WAP) to meet a milestone of developing projects to fulfill the remaining 50,000 AFY to 70,000 AFY of shortage reduction.

This document provides a brief update to project status information that was presented in the 2014 Water Action Plan (WAP) Update. In that report, completed more than four years ago, the WAP included 14 potential water supply projects or project categories. Additional projects or project concepts developed after the 2014 WAP Update are also included here. Projects were previously prioritized on a 3-tiered system and were identified as active at the time, anticipated for future activity near the end of the First Increment or beyond, or inactive for the duration of the First Increment. This update eliminates the Tier 1, 2, and 3 designations, which have become less effective for prioritizing projects over time. Instead, the present update focuses on the current project status as active, future, or inactive as the end of the First Increment approaches in late 2019.

The table below summarizes the present status of each WAP project or project category. For the purposes of this memo, “active” projects are those that are currently operational or under construction. “Future” projects are currently in various stages of planning or design; some combination of these projects is needed to meet the First Increment Water Objective. Projects identified as “inactive” are those for which there is currently no ongoing pursuit or evaluation underway.

WAP Projects Brief Status Updates

Project	Location
Active Projects	
Nebraska Groundwater Recharge <ul style="list-style-type: none"> • Phelps County Canal <ul style="list-style-type: none"> ○ Program score = 2,700 AFY. ○ Non-irrigation season recharge of divertible excess flows. ○ Program allocation is 75 percent. ○ CNPPID Water Service Agreement extended through 2023. 	Nebraska



Project	Location
<p>Nebraska Groundwater Recharge (cont'd)</p> <ul style="list-style-type: none"> • Cook recapture well <ul style="list-style-type: none"> ○ Program score = 160 AFY. ○ Recaptures groundwater intentionally recharged through Phelps County Canal, can pump when there are deficits to USFWS target flows and no risk of ice issues. ○ Well permit issued by Tri-Basin NRD in 2015. • CPNRD canals <ul style="list-style-type: none"> ○ Non-irrigation season recharge of divertible excess flows through Thirty Mile, Cozad, and Orchard-Alfalfa canals. ○ Water Service Agreement for recharge diversions up to 5,000 AF per year extended through 2024. • NPPD canals <ul style="list-style-type: none"> ○ Non-irrigation season recharge of divertible excess flows through the Gothenburg and Dawson County canals. ○ Water Service Agreement extended through 2025. • Elwood Reservoir <ul style="list-style-type: none"> ○ Program score = 2,800 AFY. ○ Primarily non-irrigation season recharge of divertible excess flows; recharge during irrigation season is possible at times. ○ Program allocation is 50 percent, with upper limit of 30,000 AF per calendar year diversions into reservoir for recharge. ○ CNPPID Water Service Agreement extended through 2023. • Broad-Scale Recharge <ul style="list-style-type: none"> ○ Project developed at Cottonwood Ranch complex. ○ Engineering design and permitting completed in 2018, construction completed in 2019, project expected to be operational in 2020 after vegetation is established. ○ Initial Water Service Agreement with CNPPID through 2032. ○ No additional BSR projects are planned at this time. 	<p>Nebraska</p>
<p>Net Controllable Conserved Water (No Cost)</p> <ul style="list-style-type: none"> • Program score = 260 AFY. • Conservation measures that made this water available were funded by USBR grant, water credited to Lake McConaughy EA at no cost to the Program. 	<p>Nebraska</p>
<p>Pathfinder Municipal Account Lease</p> <ul style="list-style-type: none"> • Program score = 6,350 AFY. • Program leases base volume of 4,800 AFY, with option for up to 4,800 AF additional depending on hydrologic conditions. • Lease agreement with Wyoming Water Development Office extended through 2032. 	<p>Wyoming</p>



Project	Location
<p>Nebraska Water Leasing</p> <ul style="list-style-type: none"> • CPRND canals <ul style="list-style-type: none"> ○ Surface water lease from Thirty Mile, Cozad, and Orchard-Alfalfa canals. ○ From 2015-2017, water measured and returned to river at canal headgates during irrigation season. ○ During 2018 and 2019, pilot exchange project added leased water to Lake McConaughy EA following end of irrigation season. • CNPPID irrigators <ul style="list-style-type: none"> ○ Project score = 1,900 AF. ○ 9 inches/acre into EA following end of irrigation season, enrollment now capped at 3,000 acres. <ul style="list-style-type: none"> ▪ 1,037 acres in 2016 (778 AF). ▪ 1,275 acres in 2017 (956 AF). ▪ 2,055 acres in 2018 (1,541 AF). ▪ 2,948 acres in 2019 (2,211 AF). ○ Lease agreement extended through 2023. • NPPD canal(s) <ul style="list-style-type: none"> ○ Surface water lease from Gothenburg and Dawson County canals. ○ Pilot exchange project in 2019 to add water to Lake McConaughy EA following end of irrigation season. 	<p>Nebraska</p>
Future Projects	
<p>Nebraska Groundwater Recharge</p> <ul style="list-style-type: none"> • Recharge Recapture Well Field Project(s) <ul style="list-style-type: none"> ○ Recapture groundwater intentionally recharged through Phelps County Canal, Elwood Reservoir, and Cottonwood Ranch. ○ Conceptual design in progress in 2019. Construction of first wells anticipated in 2020. 	<p>Nebraska</p>
<p>Nebraska Water Leasing</p> <ul style="list-style-type: none"> • CNPPID Storage and/or NCCW Lease <ul style="list-style-type: none"> ○ Water would be credited to Lake McConaughy EA. • North Platte Irrigator/Irrigation District Lease(s) <ul style="list-style-type: none"> ○ Water would be delivered downstream and credited to Lake McConaughy EA. 	<p>Nebraska</p>
<p>Nebraska Water Management Incentives</p> <ul style="list-style-type: none"> • Program sponsored conservation-related UNL-TAPS and PRECIP programs in 2017 and 2018. • Concept may be expanded to include irrigation system improvements to facilitate future water leasing projects. 	<p>Nebraska</p>



Project	Location
<p>Slurry Wall Gravel Pit Storage</p> <ul style="list-style-type: none"> GC recommended pursuit of full-scale initial slurry wall storage project, Lakeside pit acquired in 2017. Engineering design completed in 2019. Permitting and construction not to proceed at this time per GC consensus. 	Nebraska
Inactive Projects	
<p>J-2 Regulating Reservoirs</p> <ul style="list-style-type: none"> Pre-feasibility, feasibility, and score analyses completed by 2013. Design activities continued into 2016, when GC placed project on hold due to escalating materials and construction costs and land acquisition issues. 	Nebraska
<p>Elm Creek Reregulating Reservoir</p> <ul style="list-style-type: none"> Feasibility study completed in January 2011; based on extensive concerns, GC declined to move forward. 	Nebraska
<p>Acquire & Retire</p> <ul style="list-style-type: none"> Single property with small Alliance Irrigation District allocation acquired in 2016, site improvements were constructed in 2018. Pursuits to acquire additional water from nearby properties were unsuccessful. Property was sold in 2019 per direction of GC. No further plans for this type of water acquisition at this time. 	Nebraska
<p>Glendo Reservoir Storage</p> <ul style="list-style-type: none"> Not available for Program use. Wyoming’s allocation of Glendo storage water is needed to meet replacement water obligations in compliance with the 2001 Modified North Platte Decree. 	Wyoming
<p>Colorado Groundwater Management</p> <ul style="list-style-type: none"> Additional recharge capacity for the Tamarack III project not expected to be added in the near future. 	Colorado
<p>Nebraska Groundwater Management</p> <ul style="list-style-type: none"> Feasibility assessment for Funk Lagoon project completed in 2015, WAC recommended no further pursuit as WAP project. No other potential projects under consideration at this time. 	Nebraska
<p>Power Interference</p> <ul style="list-style-type: none"> No new information developed since 2000 Reconnaissance-Level WAP. No plans to pursue during First Increment or beyond. 	Nebraska
<p>Wyoming Water Leasing</p> <ul style="list-style-type: none"> No new information developed since 2000 Reconnaissance-Level WAP. No plans to pursue during First Increment or beyond. 	Wyoming
<p>LaPrele Reservoir</p> <ul style="list-style-type: none"> No new information developed since 2000 Reconnaissance-Level WAP. No plans to pursue during First Increment or beyond. 	Wyoming