to: PRRIP Scoring subcommittee

from: PRRIP Executive Director’s Office

subject: Update to the PATHFINDER MUNICIPAL ACCOUNT Lease scoring analysis

date: August 15, 2018

# INTRODUCTION

This memo serves to update the score analysis for the Pathfinder Municipal Account Lease Water Action Plan (WAP) project with the intent of revising the project score to better reflect actual operations. The original score analysis completed and approved by the Governance Committee (GC) in 2014 assumed an average annual volume of 4,800 acre-feet per year (AFY) of releases from the Pathfinder Municipal Account to the Platte River Recovery Implementation Program (Program). The Program’s 2011 lease agreement with the Wyoming Water Development Office for water in the Pathfinder Municipal Account (**Appendix A**) allows for the Program to purchase up to 4,800 AF of additional water each year if it is available, for a total of 9,600 AF. Since the initiation of the Pathfinder Municipal Account Lease in 2012, the Program purchased additional water in four of seven years and declined to purchase available additional water in another year[[1]](#footnote-1), as shown in **Table 1**. Documentation of the annual transfers is provided in **Appendix B(1-6)**. The scoring analysis was updated to account for the frequent availability of additional water in the Pathfinder Municipal Account.

**Table 1. Pathfinder Municipal Account annual leases**

|  |  |  |
| --- | --- | --- |
| **Year** | **Year type** | **Lease amount (AF)** |
| 2012 | Normal | 4,800 |
| 2013 | Normal | 4,800 |
| 2014 | Normal | 9,600 |
| 2015 | Wet | 9,600 |
| 2016 | Wet | 4,8001 (declined additional 4,800) |
| 2017 | Wet | 9,600 |
| 2018 | Normal[[2]](#footnote-2) | 8,100[[3]](#footnote-3) |

For additional background on the Pathfinder Municipal Account, please refer to the original Pathfinder Municipal Account Lease score memo[[4]](#footnote-4).

# METHODOLOGY

The methodology used in the score update followed the same approach and held to the same assumptions of the original analysis to align with the Scoring Subcommittee’s past recommendations:

* Pathfinder Municipal Account water is transferred to the Lake McConaughy Environmental Account (EA) in September.
* Transit losses between Pathfinder Reservoir and Lake McConaughy are based on the WMC loss model[[5]](#footnote-5).
* Evaporation losses are assessed while the leased water is stored in the Lake McConaughy EA until it is released to reduce shortages to US Fish and Wildlife Service (FWS) target flows.
* Transit losses between Lake McConaughy and Grand Island are also based on the WMC loss model.
* A spring release pattern is assumed, with releases starting in March of most years.
* Corresponding to the “annual pattern” scenario[[6]](#footnote-6) evaluated as part of the original score analyses, if there are no shortages at Grand Island in March of a given year, releases from the Lake McConaughy EA are delayed until the first month with shortages (as late as August of some years).

The standard assumptions for Program scoring analyses, routing losses between Pathfinder Reservoir and Lake McConaughy, routing losses between Lake McConaughy and Grand Island, and evaporation rates from Lake McConaughy used for this scoring update are identical to those used in the original scoring analysis. As these parameters were discussed in detail in the original score memo the relevant information and values are reproduced for reference purposes in **Appendix C**.

Whereas the original Pathfinder Municipal Account Lease score analysis evaluated two different release patterns using three different calculation methods, the updated score analysis is most consistent with the “spring release-annual pattern” combination scenario. The primary difference in the methodology used for the updated score analysis was in the annual yield at Lake McConaughy calculations. The original analysis assumed an average annual contribution to the Lake McConaughy EA of 4,494 AFY after accounting for transit losses between Pathfinder Reservoir and Lake McConaughy. The updated analysis adjusts the yield at Lake McConaughy for each year in the analysis period to account for years with higher (9,600 AF) and lower (4,800 AF) releases from the Pathfinder Municipal Account.

# ALTERNATIVES CONSIDERED FOR EFFECT ON SCORE

Three scenarios were evaluated for the updated score analysis based on different assumptions of how frequently additional water in the Pathfinder Municipal Account would be available for the Program to lease. The scenarios use year type, as determined by the annual hydrologic condition of wet, normal, or dry, as the indicator for water availability. The three scenarios are as follows:

* **Scenario 1 (wet years only):** the additional 4,800 AF of lease water is only available during wet years. During wet years a total of 9,600 AF is released from the Pathfinder Municipal Account and in normal and dry years a total of 4,800 AF is released. Wet years account for 16 of 48 years (33 percent) during the 1947-1994 analysis period.
* **Scenario 2 (wet years and half of normal years):** the additional 4,800 AF of lease water is available during all wet years and every other normal year. During all wet years and every other normal year a total of 9,600 AF is released from the Pathfinder Municipal Account while in all dry years and the remaining normal years a total of 4,800 AF is released. Under this scenario, additional water is available 26 of the 48 years in the analysis period (54 percent).
* **Scenario 3 (all wet and normal years):** the additional 4,800 AF of lease water would be available during all wet and normal years. A total of 9,600 AF is released from the Pathfinder Municipal Account in all wet and normal and in dry years a total of 4,800 AF is released. Wet and normal years account for 36 out of 48 years (75 percent) in the analysis period.

# SCORE ANALYSIS RESULTS

Similar to the original score analysis, the updated score analysis routes water released from the Pathfinder Municipal Account (either 4,800 AF or 9,600 AF, depending on scenario) to Lake McConaughy in September of each year. Evaporation losses are then applied to the stored water until it is released to reduce shortages to target flows in the spring. Water is released in the first month that has shortages to target flows, beginning in March and extending through August in a few years. Project score at Grand Island is considered the yield at Lake McConaughy less evaporation losses in storage and routing losses to Grand Island as calculated using the WMC Loss Model. The revised score estimates for the Pathfinder Municipal Account Lease WAP project range from an average of approximately 5,300 AFY – 6,800 AFY[[7]](#footnote-7), depending on the scenario as shown in **Table 7**. Expanded results for Scenarios 1, 2, and 3 are tabulated in **Appendix** D (Releases from Lake McConaughy EA) and **Appendix E** (Score at Grand Island).

Table 7. Score analysis results for alternative scenarios.

|  |  |
| --- | --- |
| **Scenarios** | **Score**  **[AFY]** |
| Scenario 0 (4,800 AFY in all years) | 3,940[[8]](#footnote-8) |
| Scenario 1 (9,600 AFY 33% of the time: wet year only) | 5,270 |
| Scenario 2 (9,600 AFY 54% of the time: wet years & every other normal year) | 5,940 |
| Scenario 3 (9,600 AFY 75% of the time: wet & normal years) | 6,760 |
|  | |

# RECOMMENDED SCORE

**TBD based on scoring subcommittee recommendations**

**Appendix A**

**PRRIP-WWDO Water Service Agreement (July 2011)**

**Appendix B**

**2013-2018 Pathfinder Lease Letters**

**Appendix C**

**Key Scoring Assumptions, Routing Losses, and Evaporation Losses**

**Appendix D**

**Releases from Lake McConaughy Environmental Account (Scenarios 1-3)**

**Appendix E**

**Score at Grand Island (Scenarios 1-3)**

1. Per a letter from the Wyoming Water Development Commission dated April 12, 2016, an additional 4,800 AF was available for delivery in September 2016. Per an email from Jerry Kenny dated June 22, 2016, this additional water was declined by the PRRIP and the USFWS. [↑](#footnote-ref-1)
2. Tentative. The real-time hydrologic condition was “normal” from January 2018 through mid-August 2018. [↑](#footnote-ref-2)
3. Per a letter from the Wyoming Water Development Office dated July 2, 2018, drier than normal conditions and below average runoff in 2018 limited additional water available to 3,300 AF, for a total of 8,100 AF. This was accepted by PRRIP and USFWS. [↑](#footnote-ref-3)
4. Pathfinder Municipal Account Recommended Score and Scoring Analysis. Office of the Executive Director of the Platte River Recovery Implementation Program memo to the Program Scoring Subcommittee. March 2014 [↑](#footnote-ref-4)
5. Refer to the original score memo for further details. [↑](#footnote-ref-5)
6. The original score analysis also evaluated “modeling period average” and “representative year” scenarios and concluded that “the utilization of a different calculation method does not produce significantly different results.” [↑](#footnote-ref-6)
7. Rounded to nearest 100 AFY. [↑](#footnote-ref-7)
8. GC approved a score of 4,000 AF for this scenario in 2014. [↑](#footnote-ref-8)