



Nevada Irrigation District

April 24, 2023

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Re: Response to March 9, 2023, Follow-up to Plan for Water (PFW) Questions and NID Responses

Dear Ms. Sheehan and Mr. Zettler Mann,

Thank you for your letter dated March 9, 2022, regarding the District's Plan for Water (PFW) process. Below are responses to your comments:

Comment: Referring to Question 2 regarding PFW glossary of terms – Our proposal would be that NID adopt a statewide glossary that includes mutually accepted definitions, which is essential for consistency and public acceptance. We provided a link to the state's basic- water glossary, which we encourage NID to adapt, in its entirety, to its PFW glossary. If there are particular definitions that NID does not agree with, or specific reasons why NID does not want to follow the statewide agreed upon definitions, we would request to understand why and how existing glossaries do not meet NID's needs. We would be happy to work with you on adjusting definitions as needed.

Response: As stated in the last stakeholder meeting, the PFW glossary will be finalized when the PFW Report is complete. This will ensure that the words and definitions utilized are relevant to the final report.

Comment: Referring to Question 3 regarding limitations of NID's historical water use data – We do not disagree that there will always be uncertainties when capturing and modeling water loss and demand data. Our question is aimed at ensuring that NID is accounting for overestimating and underreporting. Understanding the uncertainty in the data being used by the model is crucial to knowing how to calibrate the model. The development of an upper and lower bound when running the suite of modeling options to develop the range of possible scenarios relies on assuming the historical water usage data is accurate within some margin of error. Without knowing what that margin of error is, setting the upper and lower bounds for modeling becomes an unknown level of

guesswork. We appreciate that the plan will be updated every 5 years, however, ensuring that the data relied on at the outset of the PFW is sound is also critical.

Response: Comment noted. Water use data will be discussed in the stakeholder group during the formation of the scenarios and ongoing discussions surrounding calibration of the model. The model and data is intended to be reviewed by the Board of Directors on an annual basis as part of the NID budgeting process. This frequency is intended to help with ongoing calibration of actual and projected datasets.

Comment: Referring to Question 4 regarding OpenET dataset – We understand how OpenET operates and how it can potentially be problematic to rely on due to its limited spatial resolution. The nature of remote sensing data, like that relied upon by OpenET, is that each pixel (30m x 30m for Landsat) is assigned a value. The end user, OpenET, NID, and the Consultant team, then have to decide what that number means as it relates to water demand. We would like to understand what rules will be followed to decide how a given pixel is classified as related to its assumed raw water demand. This is especially important in places where a single pixel is comprised of multiple land uses, not all of which are being irrigated.

Response: To clarify, the consultant team is not using OpenET data directly or exclusively to compute “assumed raw water demand” in the projected PFW demand model scenarios. OpenET data is being used to observe trends and evaluate representative evapotranspiration (ET) rates for land uses in NID (e.g., average ET and percentiles across many thousands of pixels in NID). OpenET is only one piece of information that is being used to develop representative crop coefficients for different land uses in NID. In the projected demand model, ET is being calculated based on climate-related information and these representative crop coefficients. OpenET data will not be used to directly assign an ET value to any single point in the demand model. Other information that is being used to evaluate and develop crop coefficients are referenced in the draft list of “Nevada Irrigation District Plan for Water - Demand Model Data Sources and Assumptions” (under “Evapotranspiration”).

Regarding the spatial resolution of OpenET, 30 m x 30 m (0.22 acres) is the smallest standard resolution for remote sensing information related to ET. Each pixel is about the size of a baseball field’s infield area, or less than 0.0001% of the total area within NID’s boundaries. While there are methods to quantify ET on the ground at finer spatial resolution (e.g., using eddy covariance stations), those methods are much more expensive and are only representative of the conditions in each single field that is monitored. One significant advantage of remote sensing-derived ET estimates is that they capture a range of ET characteristics across large, diverse landscapes. Because the individual OpenET pixels are not being used directly to estimate ET for any one particular field in NID, slight changes in ET due to mixed land uses will, to some extent, average out across the numerous pixels evaluated for each land use. Further, if mixed uses are typical of certain land uses, the resulting effects on ET (e.g., lower ET) will be captured across the full range of pixels and

impact the crop coefficients that are used to be more representative of the unique conditions in NID.

Comment: Referring to Question 5 regarding “groundtruthing” – It was our understanding that there was a conversation around the need for “groundtruthing” on real raw water use due to the uncertainty of relying on historical data, crop reports, etc. Raw water audits would provide a critical on-the-ground accounting, or “groundtruthing” with respect to water deliveries and demand that would greatly benefit and enhance the PFW model.

Response: Comment noted.

Comment: Referring to Question 6 regarding model weighting – We appreciate the clarification that model inputs are not weighted differently in the model, and that instead, upper and lower boundaries will be established based on model inputs. However, the upper and lower boundaries which will be established as part of the model will rely on a suite of data sources you name. These data will not always agree because they all estimate water demand using different metrics and different spatial and temporal scales. In the event where the four data sources all suggest a different demand at a location, how are the differences reconciled to come up with the single demand value at that location and point in time?

Response: The PFW demand model is a planning tool meant to characterize multiple potential future demand scenarios (including upper and lower boundary scenarios) in NID, and it will not be used to report a single demand value for any single location at a point in time.

As described above, information such as the OpenET data (and other ET data sources) are being used to develop representative parameters and inputs to the demand model. The demand model simulates representative demand conditions for certain land uses, soil types, and zones of NID. Those demand conditions are being linked to parcels based on location and land use information, but they are fundamentally representative conditions, not specific for any single point.

The consultant team is reviewing an ensemble of the available data sources and conducting sensitivity analyses for key parameters and inputs to develop demand model scenarios that represent baseline, low (e.g., 10th percentile), and high (e.g., 90th percentile) demand levels. These sensitivity analyses are in progress but will be presented at the next demand model presentation.

We look forward to your continued participation in the Plan for Water Process. Should you have any questions please feel free to contact me.

Sincerely,



Jennifer Hanson
General Manager