

Mr. David Cuneo
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Sonoma County Water Agency
404 Aviation Boulevard
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Dear Mr. Cuneo,

The following comments on the NSCARP FEIS/EIR are made on behalf of the Clean Water Coalition of Northern Sonoma County. I am a geologist, retired from 35 years as a Research Geologist with the U.S. Geological Survey (USGS). I worked on many projects with the USGS, but the last half of my career focused on a wide range of human-induced environmental problems in the western U.S. This work has been published in more than 150 papers in peer-reviewed scientific journals and USGS reports (also peer-reviewed) and one book. Since retirement I have co-authored a book published (May, 2008) by Oxford University Press on environmental issues in the western U.S. My focus in the following comments is on reservoir site selection and characterization.

General Reservoir Issues

The NSCARP FEIS/EIR fails to resolve the basic issues of reservoir design and emplacement, lack of consistency in choice of reservoir sites, and the threat of surface and groundwater pollution by leakage of reservoirs. The protocols for mitigation of likely problems use a blanket approach to all reservoirs. Reservoir site characterization is almost entirely missing from the FEIS/EIR so that suitability of the sites is put off to future studies and “mitigated” by regulatory standards. Should sites be assessed by future study to be infeasible, it will undo all of the ancillary calculations for pipelines and other facilities presented in the FEIS/EIR. The net result of this backward approach is that the public is not given a viable document to review.

There is no change from the DEIS/EIR regarding the use of very preliminary geologic investigation of only 5 sites at two locations as representative of the all issues that may occur at the 17 proposed sites. These reports (Geoservices Group, 2001; 2002) state quite clearly that they are preliminary only and much more work is required for proper site characterization and risk analysis.

I commented on the inadequacies of these reports for meaningful site characterization in the DEIS/EIR; Responses AJ-2, AJ-16 and AJ-17.

These responses addressed only referencing issues not the substance of the comment (AJ-2); Master Response 6, given for responses AJ-16 and 17 states that “the engineering and geotechnical studies were conducted at a level commensurate for the feasibility stage of the project.” Since the only work actually done itself admits that more study is needed to establish feasibility, this statement is incorrect. No commensurate work at all was done on all other sites, including new ones proposed in the FEIS/EIR.

Master Response 6 further admits that future studies may determine some sites to be unsuitable; this admission underscores the conclusion reached in the preceding paragraph. Response AJ-16 refers the reader to two sources (NSCARP Feasibility Study, Volumes I and II) for additional information on site suitability analyses, and states these are available on the SWCA website. However, v. I refers to reservoir details in Appendices A-D, which are not linked. A search of the SCWA website for v. II returned me to response AJ-16!

Response AJ-19 on specific site issues refers the reader to AJ-16, which is inadequate for reason that relevant information is not available for public review.

Response AJ-20, to a comment that the Geoservices Group reports on 5 sites at 2 locations are incomplete and not representative of all 19 sites selected in the DEIS/EIR and cannot be used for mitigation evaluation or assigning Impact Category or CEQA Thresholds of Significance, again refers the reader to Master Response 6, which again fails to respond to the comment for reasons given above.

More thorough analyses of geotechnical issues of some reservoir sites proposed by NSCARP are not mentioned in the FEIS/EIR; they call into question the appropriateness of the NSCARP selection procedure, as discussed below.

Windsor Ponds T1 and S are included as a “programmatic component” and the Windsor Master EIR and Supplemental EIR are incorporated by reference. The FEIS/EIR fails to summarize the potential environmental impact findings of these documents as required by NEPA and CEQA. Geotechnical analyses presented by the Windsor documents cast doubt on the mitigation of the reservoir leakage issue offered by the NSCARP FEIS/EIR, also discussed below.

Table 2-3 (Reservoir Sites Eliminated from Further Consideration) includes sites eliminated by reason of geologic instability, presence of active faults, and required stream diversion. Sites having those same problems¹ are, however, included in Tables 2-5 and 2-6, which list information on sites proposed under Alternative 2. No reason is given why sites that share common problems are listed as eliminated or proposed. Response AJ-19, which responds to a comment on this issue is simply an unhelpful reference to Response AJ-16 (see comment above). Thus, good and acceptable reasons, based on site-specific information, for why the chosen sites are considered suitable must be provided.

Specific Reservoir Issues

Site characterization

p. 2-23 to 2-41, Alternative 2. Almost no site-specific information is given on the characteristics of reservoir sites that bear on their suitability. The information provided

mostly details storage capacity, with brief description of dam type, and occasionally comments on the general topography of the site, interspersed with pipeline information.²

p. 2-46. Under Construction Considerations, Alternative 2, a single short paragraph gives no site-specific information on any construction issues. It is stated that, “if necessary” clay liners or cutoff trenches will be installed to prevent off-site leakage.

Jordan A, C reservoirs, Alexander Valley

p. 2-52. Under Alternative 3, it is stated that “Details of these two reservoirs (Jordan A and C) have been previously described under Alternative 2. Their design under Alternative 3 would remain unchanged.” The only information on these sites given under Alternative 2 is their storage capacity and location. That is repeated here. Under construction issues for these reservoirs, it is stated only that heavy earthmoving equipment will be needed, dam materials might have to be imported, and it may take two seasons to complete the reservoirs.

By contrast, two geotechnical reports prepared for the City of Santa Rosa’s Seasonal Storage Project, dated November 7, 2007, provide much more site-specific information on the Jordan A and C sites (called AVR Sites 1 and 2) summarized as follows:

CH2MHILL, 2007, IRWP Seasonal Storage Project Geotechnical Evaluation, Technical Memorandum, Prepared for the City of Santa Rosa, Appendix E

p. 7-8, Table 3. Principal problems with the AVR (Jordan) sites include presence of fractured rock at shallow depth; fault rupture and strong seismic ground shaking; permeable embankment foundation material; difficult bedrock excavation; removal or stabilization of numerous landslides and potential landslides; seepage through bedrock fractures; presence of significant populations of sensitive plant species that would be disturbed by extensive trenching and other on-site investigations necessary to determine feasibility of project.

p. 9. Geotechnical feasibility cannot be determined without extensive additional investigations, including expensive trenching which may not provide the definitive information required regarding fault locations.

p. 10. Given the significant magnitude, cost and complexity of the investigation required to determine geotechnical feasibility, and the extent to which such disturbance may affect sensitive plant species, “the City has determined that there is an adequate basis to eliminate the AVR site (Jordan sites) from further analysis because it is not ‘feasible’ as that term is defined by CEQA.”

Winzler & Kelly, 2007, IRWP Seasonal Storage Project, Conceptual Design Development, Technical Memorandum, Prepared for the City of Santa Rosa.

p. 12. “At the AVR (Jordan) ponds, where bedrock is expected to be shallow, the variable slope and character of the reservoir bottom and the rocky character of embankment materials will make lining impractical. Seepage from the ponds will be under the embankment and down the valley, although highly fractured or otherwise

permeable rock might also provide a path for seepage through one of the narrow ridges confining the pond.”

p. 13. Presence of hard rock and difficult foundation conditions may require extensive grouting and dental concrete, and reservoir seepage losses through fractured rock may require special handling [interception and return to reservoirs].

p. 17. If the ponds are unlined, seepage from the ponds may move laterally about 10 feet per year

Both of these reports were available in time for use in the FEIS/EIR, but are not mentioned.

Windsor Ponds T1 and S

Substantial geotechnical information is provided in documents supporting the Windsor Master and Supplemental EIRs, which, under NEPA and CEQA, should have been summarized in the FEIS/EIR. The ponds are to be lined with synthetic membrane liners, possibly with liner protection by a cover consisting of onsite soils mixed with cement. Recognizing that liners do not provide “full protection” of surface and groundwater, leakage rates are estimated by CHM2HILL, 2008, Hydrogeologic Evaluation for the Eastside Road Storage Project, Technical Memorandum, Appendix E.

Water Contamination Issues

Use of the reservoirs proposed by NSCARP is likely to cause contamination of both surface water and groundwater. Because they are interconnected, surface water contamination, for example by frost-protection spraying and leakage of reservoirs, inevitably leads to groundwater contamination.

Chapter 2, p. 2-13 to 2-14 of the NSCARP DEIR/EIS appropriately rejects a plan to store recycled water underground for fear of migration of injected water beyond the desired limits. My DEIS/EIR comment 9 that this was equally applicable to surface storage and use of recycled water for frost protection elicited response AJ-30, which referred the reader to Master Comments 7, 8, 9. Master Comment 7 is not relevant—proper use, by the standards proposed, as well as improper use of recycled water may result in surface water and groundwater contamination. Master Comment 8 recognizes contamination of groundwater as a significant impact, but NSCARP’s FEIS/EIR supposition, p. ES-30, that clay liners to be “fully protective” of groundwater is neither widely accepted, or even adopted by the analyses accompanying Windsor Ponds T1 and S. Master Comment 9 is not relevant to the fact of groundwater contamination once it happens.

Comments made on the issue of groundwater contamination in the DEIR/EIS elicited further very unsatisfactory responses: Response AJ-31 refers the reader to Master Comments 7, 8, and 9, comments AH-34 and AH-20, and revised Mitigation Measure HWQ-4. Master Comment 7 is not relevant for the reason given above. Master Comment 8, with reference to monitoring, only establishes when the horse is out of the barn, not how to prevent the problem. The statement that the mitigation measures are designed to

“prevent recycled water from entering groundwater in any appreciable quantity” is inconsistent with the monitoring program since exceedance of MCLs is already “appreciable.” Replacing liners should be described in detail, and the operational impacts discussed. Re Master Comment 9, this only illustrates the inadequacies of Title 22—who will be comfortable with a potential source of contamination 100 feet from their water well? While the Comments AH-20 and AH-34 are themselves appropriate, the responses are unhelpful.

The NSCARP FEIS/EIR does not provide even a brief description of the monitoring protocol that is to “fully protect” groundwater from leakage from reservoirs. One must assume that wells will be sunk into the aquifer below each reservoir and sampled/analyzed on an unspecified schedule. This approach only informs of the problem after it has already reached the aquifer. A better approach, not discussed at all, is to double line the reservoirs and monitor fluid accumulation in the lower liner. It is also necessary to fully describe protocols to be followed in the event of liner failure and to specify the mode of disposal of treated water drained from the reservoir for repairs.

Endnotes

¹Appendices A-D (Engineering Feasibility Study, v. II) list limitations “that could have a major effect on continued consideration” of suitability for almost all of the (then)-19 sites. The types of limitations listed include:

- Active faults in the immediate vicinity of proposed reservoir sites Jordan A, Jordan C, Bucher, Passalacqua #3, Kuimelis #1, Bilbro-Biocca, Todd, and Klein Foods;
- Landslides in abutment and reservoir footprints for proposed reservoirs Jordan A, Jordan C, Bucher, Russell-Bucher, and Becnel #2;
- The need to import materials for dam construction at the Kuimelis #2, Todd, Bucher, and Becnel #2 sites;
- A pumping requirement for filling of or releases from reservoirs Jordan A and C, Lytton, Passalacqua #3, Kuimelis #1, Kuimelis #2, Bilbro-Biocca, Todd, Klein Foods, Gallo Asti, Russell-Bucher, and Gallo Twin Valley;
- The need to construct major diversions for preventing natural inflow into the Gallo Asti reservoir; and one other reservoir.
- Construction of Kuimelis #1 and Kuimelis #2 in sensitive wildlife habitat.

² Following is a summary of site-specific “geotechnical” information provided by the FEIS/EIR; some of the information is not directly stated, but must be gleaned from maps of geology, landslides and faults, which are at very poor scales; in a number of cases, locations and map scales were insufficient to determine where the site is with respect to geologic hazards

Jordan A and C: Information provided: locations; steep terrain; landslides and faults present; located on weak foundation rock

Lytton reservoir enlargement: location

Robert Young Home Ranch reservoir enlargement: location

Kuimelis #1: located in hills; faults in immediate vicinity, located in sensitive wildlife habitat

Kuimelis #2: apparent steep slopes; faults in immediate vicinity; located in sensitive wildlife habitat

Todd: located in hills; faults in immediate vicinity

Klein Foods: located in hills; faults in immediate vicinity

Allo Asti existing: located in hills; construction of diversion required

Russell-Bucher: located in hills; localized landslides; landslides in abutment area; weak bedrock; landslides in abutment area

Becnel: located in hills; localized landslides; landslides in abutment area; weak bedrock; landslides in abutment area

Bucher: located in hills; localized landslides; landslides in abutment area; landslides in abutment area; faults in immediate vicinity

J Wine: located on drainage divide

Gallo Twin Valley existing reservoir: located in hills

Denner Ranch #2: location

Windsor T1 and S: location

Sincerely,

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