

**NARROWS PROJECT
SUPPLEMENTAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT**

APPENDIX B

**IDENTIFICATION AND EVALUATION OF
POTENTIAL DAM SITES**

July 25, 1996

To: Files

From: Richard Noble

Subject: Identification and Evaluation of Potential Dam Sites in Sanpete Valley

This document describes a process that was used to identify and evaluate potentially practicable dam sites in north Sanpete Valley. USGS 7.5 minute quadrangle maps were used to identify potentially suitable sites. The goal of this initial search was to find sites that would serve as alternatives to the Narrows Reservoir site and that could create reservoirs with a minimum storage capacity of 5,400 acre-feet, either individually or collectively. Attached is a map showing the location of the 10 sites identified and considered. Following is a tabulation of data related to the sites:

Site	Area (sq. ft.)	Average Depth (ft.)	Max Volume (AF)	Dam Ht (ft.)	Length (ft.)	Max Elevation (ft.)
1	9,728,000	40	8,933	120	2900	6600
2	11,392,000	120	31,383	240	4800	6600
3	40,601,600	20	18,642	50	3000	6280
4	2,560,000	100	5,877	300	1400	7200
5	7,680,000	300	52,893	450	2000	7200
6	1,177,600	40	1,081	90	800	6520
7	5,939,200	40	5,454	120	2800	6400
8	3,840,000	60	5,289	140	1500	6200
9	4,275,200	120	11,777	240	2200	6600
10	2,432,000	120	6,700	240	1200	7200

Site 8 would require pumping from the reservoir to service much of the project area. Those reservoirs with elevations greater than 7000 would need to have a diversion structure and pipeline constructed approximately 2 miles up Cottonwood Canyon to be supplied by gravity flow. This may be infeasible because of the geologic instability of the canyon. Sites 1,2 and 9 would require a diversion approximately 3/4 miles up Cottonwood Canyon.

Initial screening of the above sites resulted in two sites being investigated further. Screening criteria was based on location, dam height and length, and ability of the site

to delivery project water with minimal or no pumping. Based on initial screening, sites 1,2,4,6,7,8,9 and 10 were eliminated from further consideration. Preliminary dam height versus capacity curves were developed for sites 3 and 5 to determine the dam height necessary to develop 5,400 acre-feet of storage. Four feet of freeboard is assumed for this more detailed analysis.

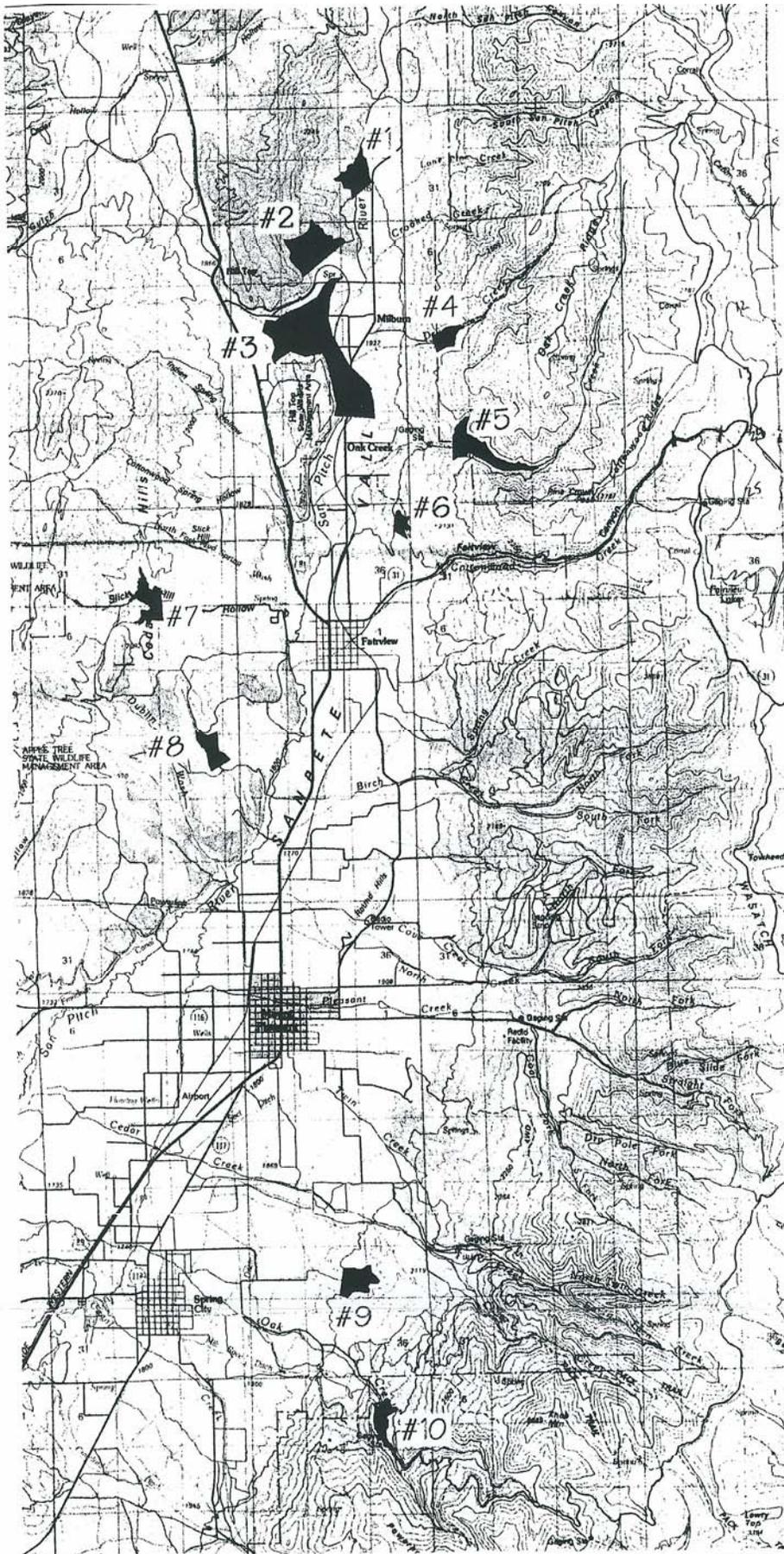
Site 3 would require a dam height of 64 feet and a length of 2,185 feet to develop 5,400 acre-feet. Reconnaissance level cost estimate for constructing a dam at Site 3 is \$9.5 million. It would also require annual pumping costs of \$95,000 to service project lands and approximately 6,000 feet of additional pipeline to connect the reservoir to the Oak Creek Pipeline at an estimated cost of \$1.3 million. The county road would also need to be rerouted around the reservoir. It is estimated that this cost would be comparable to relocation of the highway for Narrows Dam, which is \$1 million.

Site 5 would require a dam height of 185 feet and a length of 1,190 feet and would cost approximately \$91 million. Site 5 would have the additional cost of one mile of additional pipeline in Cottonwood Canyon and an another mile of pipeline from the Oak Creek Pipeline to the proposed site. The cost for these additional pipelines is estimated to be \$2.2 million.

The Oak Creek Pipeline would need to be enlarged from 10 inch PVC to 27 inch concrete pipe to carry the East Bench water with both Site 3 and Site 5. This additional cost is estimated to be \$2,5 million. Computations for these estimates are on file.

The total cost of the Site 3 alternative is \$14.3 million with annual pumping costs of \$95,000 compared to Narrows Dam costs of \$7.2 million with no pumping costs. The total cost for Site 5 is \$95 million. Clearly, these most reasonable two sites of the ten identified in Sanpete Valley are much more costly than the proposed Narrows Dam.

Richard M Noble



Sanpete Valley Dam Site Alternatives
Narrows Project

July 1993