

CHAPTER 1

Purpose of and Need for the Project

1.0 INTRODUCTION

This Narrows Project, Utah (Narrows Project) supplemental draft environmental impact statement (SDEIS) updates information and analyses contained in the Draft Environmental Impact Statement, Narrows Project (DES-98-10) published in March 1998 (1998 DEIS). This SDEIS discloses the direct, indirect, and cumulative effects of the Proposed Action and alternative actions for water development for north Sanpete County.

1.1 THE PROPOSED ACTION ALTERNATIVE

The Sanpete Water Conservancy District (SWCD) has applied to the Bureau of Reclamation (Reclamation) for a Small Reclamation Projects Act (SRPA) loan to help finance construction of a reservoir and related facilities (Proposed Action). SWCD also has requested authorization to use federally administered withdrawn lands as the site for dam construction. Most of the reservoir basin would be located on adjacent, privately owned land. If Reclamation approves the SRPA loan and land use and Congress appropriates the necessary funds, a supplemental water supply would be developed for presently irrigated lands and municipal and industrial (M&I) water users in north Sanpete County. A dam and reservoir would be constructed on Gooseberry Creek, and water would be diverted through an existing tunnel and a proposed pipeline to Cottonwood Creek; the existing tunnel would be rehabilitated. Pipelines would be

constructed to deliver the water to existing water distribution systems. Recreation facilities would be developed, and a 2,500-acre-foot minimum pool for fish habitat would be provided. The resulting water storage and delivery system would be a non-Federal project owned and operated by SWCD.

Mitigation measures would be implemented to offset adverse impacts. Additional water conservation measures would be implemented independent of the Proposed Action. To be eligible to receive water from the Narrows Project, water users would be required to use, or agree to implement, conservation measures.

1.2 LEAD AND COOPERATING AGENCIES

Reclamation is the lead agency in preparing this SDEIS. The two cooperating agencies are the U.S. Department of Agriculture Forest Service (USDA Forest Service), and the U.S. Army Corps of Engineers (USACE).

1.3 HISTORY AND BACKGROUND OF THE NARROWS PROJECT

The Narrows Project, as defined in this document, is a non-Federal project that fulfills the intent of the larger Federal Gooseberry Project that was formulated more than 70 years ago but not completed. The original Gooseberry Project was formulated over a period of several years in response to efforts by Sanpete County

individuals and entities to supplement existing irrigation water supplies and to alleviate shortages that consistently have occurred during the late irrigation season. The portion of that project that was not built was the proposal to appropriate and store Gooseberry Creek waters originating in Sanpete County and to transport those waters through a transmountain tunnel for use in north Sanpete County. The other component of the original Federal project, which was completed, was to enlarge Scofield Reservoir by 35,000 acre-feet to compensate Carbon County water users for the transmountain diversion of water to Sanpete County.

The earliest efforts to appropriate Gooseberry Creek water and transport it to use in north Sanpete County began in the early 1900s. In 1924, predecessors to SWCD filed an application with the Utah State Engineer to appropriate 15,000 acre-feet of Gooseberry Creek water and deliver it via a transmountain tunnel to Sanpete County.

Beginning in the 1930s, Reclamation, the Utah Water Storage Commission, and local Sanpete County interests undertook cooperative studies to formulate a water development plan and enhance water supplies in Sanpete County. The first published cooperative study, undertaken by Reclamation and released in May 1933, outlined what would become known as the Gooseberry Project. This report defined the Gooseberry Project as:

- ◆ Construction of a reservoir on Gooseberry Creek with an active capacity of 15,000 acre-feet and an annual yield of 9,400 acre-feet.
- ◆ Construction of a transmountain tunnel.
- ◆ Construction of feeder canals to deliver waters from other streams to the dam for transmountain diversion.

In September 1940, Reclamation released another cooperative study that revised the original plan and included expanding Scofield Reservoir as a principal feature of the Gooseberry Project. On November 2, 1940, the Utah Water Storage Commission recommended construction of the Gooseberry Project, defined as:

- ◆ Construction of a dam on Gooseberry Creek providing an annual average yield of 10,800 acre-feet to Sanpete County.
- ◆ Construction of a transmountain tunnel to deliver the water.
- ◆ Construction of feeder canals.
- ◆ Enlargement of Scofield Reservoir to provide exchange water for the unrestricted diversion of Gooseberry Creek water to Sanpete County.

On March 6, 1941, the lands necessary to complete the Gooseberry Project were withdrawn from public entry under a First Form Reclamation Withdrawal, 32 Statute (Stat.) 388; 43 United States Code (U.S.C.) Section (§) 372, et seq.

On January 2, 1942, Reclamation released a draft report outlining the Gooseberry Project Plan, including constructing an additional 43,000 acre-feet of storage capacity in Scofield Reservoir to support the unrestricted transmountain diversion of Gooseberry Creek water to Sanpete County.

In 1943, the United States decided that the Scofield Dam and Reservoir portion of the Gooseberry Project Plan should be completed first because of the hazardous conditions the existing structure posed to the war effort and the health, welfare, and safety of Carbon County residents. Reconstruction of Scofield Dam began the same year and was completed in 1946.

On October 11, 1943, and February 28, 1944, the United States entered into reconstruction and repayment contracts on Scofield Dam and Reservoir with local sponsors. The October 11, 1943, contract has subsequently become known as the “Tripartite Agreement.” Among the conditions identified for reconstructing and enlarging Scofield Dam and Reservoir, the agreement:

- ◆ Described the United States’ intent to construct and operate the remaining Gooseberry Project works.
- ◆ Stipulated that the Gooseberry Project has the right to divert and store all flows of Gooseberry Creek at or above the confluence with Cabin Hollow.
- ◆ Stipulated that Carbon County’s storage rights in Scofield Reservoir are subordinate to those of the Gooseberry Project.

On April 11, 1956, Congress enacted the Colorado River Storage Project Act (CRSP). Priority planning was directed for the Gooseberry Project at 43 U.S.C. 620a.

In September 1961, the Soil Conservation Service of the U.S. Department of Agriculture proposed the North Sanpete Watershed Work Plan to complete the 1942 Gooseberry Project Plan.

In 1962, the USDA Forest Service issued a Special Use Permit to the Gooseberry Project sponsors to construct, operate, and maintain a tunnel and appurtenances for transmountain diversion of water from the proposed Narrows Reservoir in Gooseberry Creek to Cottonwood Creek for irrigation purposes.

On July 22, 1975 with the Federal Gooseberry Project remaining un-built, Reclamation assigned the Narrow’s portion of the Gooseberry Project water right to SWCD to complete the Gooseberry Project Plan.

On March 13, 1981, SWCD filed a notice of intent (NOI) to apply for a SRPA loan to help finance the Narrows Project. The project would include:

- ◆ The Narrows Reservoir with a capacity of 17,000 acre-feet (10,000 acre-feet active storage and 7,000 acre-feet for fish and recreation).
- ◆ Two hydropower plants to provide power for project purposes.
- ◆ Improved flows in the San Pitch River by improving select facilities that would allow for more reliable exchanges without interfering with existing water rights.
- ◆ An additional 10 to 12 exchange wells in the San Pitch River Basin to provide exchange water to municipalities.
- ◆ Rehabilitation of the existing Gooseberry (Narrows) Tunnel.

On June 28, 1984, Reclamation approved the 1984 Compromise Agreement by and among the SWCD, the Price River Water Users’ Association, and the Carbon Water Conservancy District (appendix A). According to the agreement’s terms, among other things, SWCD:

- ◆ Relinquished and withdrew certain water rights.
- ◆ Agreed to a much lower transmountain diversion figure than previously contemplated (reduced to 5,400 acre-feet per year).
- ◆ Restricted sources of the water supply by excluding certain stream sources of water from the project plan.
- ◆ Limited the active and inactive storage capacity of the reservoir.

- ◆ Agreed to locate the dam and reservoir site further up the drainage of the Narrows Project site, thereby relinquishing the historic Mammoth site.

On November 1, 1984, SWCD filed an amended NOI to apply for a SRPA loan. The project had been reformulated in response to the 1984 Compromise Agreement. Specifically, SWCD proposed to:

- ◆ Construct the Narrows Reservoir to a capacity of no more than 14,500 acre-feet of active storage and 2,500 acre-feet of dead storage for fish and recreation purposes.
- ◆ Construct four hydropower plants to provide power for project purposes.
- ◆ Improve flows of the San Pitch River by improving select facilities that would allow for more reliable exchanges without interference with existing water rights.
- ◆ Drill 5 to 10 exchange wells in the San Pitch River Basin to provide exchange water to municipalities and irrigation companies.
- ◆ Rehabilitate the existing Gooseberry Tunnel.
- ◆ Enlarge the existing Gunnison Reservoir by at least 5,400 acre-feet.

On January 7, 1985, the Utah State Engineer approved both the Narrows and Scofield portion of the Gooseberry Project Plan water rights. With respect to the Narrows Project water rights, among other things, the approval:

- ◆ Set the approximate physical location of the Narrows damsite and its active storage capacity (14,500 acre-feet).

- ◆ Reduced the amount of an annual transmountain diversion to 5,400 acre-feet.
- ◆ Set the instream flow requirements.
- ◆ Restricted the sources of water supply that could be used for project purposes.

With respect to the Scofield Project water rights, the approval provided the legal authority to use 43,000 acre-feet of additional storage water in Scofield Reservoir. Both approvals were expressly made subject to the terms of the 1984 Compromise Agreement.

The effect of this decision was to give SWCD the right to divert the first 5,400 acre-feet of water occurring in Gooseberry Creek at the Narrows damsite. The decision also established a Scofield Project water right for the additional 43,000 acre-feet of storage capacity in the enlarged Scofield Reservoir. Of the 43,000 acre-feet, 8,000 acre-feet is for fish propagation. The remaining 35,000 acre-feet of capacity is for Scofield Project purposes (i.e., project water for use in Carbon County), subject only to an obligation to satisfy early water rights that otherwise would be impaired by the diversion and storage of the Narrows Project. Delays in completing the Narrows Project allow the 5,400 acre-feet of Narrows Project water to be delivered to Scofield Reservoir on a temporary basis for storage and use in Carbon County.

At this time, the hydropower plants, exchange wells, and expansion of Gunnison Reservoir were dropped as part of the project plan because of the technical and financial infeasibility of these components.

On March 7, 1985, the USDA Forest Service notified the Utah State Engineer of its claim to Federal reserved water rights in the Gooseberry Creek drainage. Because of potential conflict between water use under the

Federal reserved water rights and the Gooseberry Project water rights, the United States and the Sanpete Water Conservancy District agreed on July 13, 1989, to a water use plan to allow for continued development of the Gooseberry Project Plan. This agreement stipulated that all Federal reserved water rights, which fall within the Gooseberry Creek drainage, shall be subordinate to the Gooseberry Project water rights.

On July 20, 1990, SWCD filed a second amended NOI to apply for a SRPA loan. The project had been reformulated to conform to the agreements and stipulations contained in the 1984 Compromise Agreement and the State Engineer's Memorandum Decision. SWCD proposed to:

- ◆ Construct the 17,000-acre-foot Narrows Reservoir with an active capacity of 14,500 acre-feet supporting an annual transmountain diversion of 5,400 acre-feet.
- ◆ Rehabilitate the existing 3,100-foot-long Narrows Tunnel to facilitate releases from Narrows Reservoir.
- ◆ Relocate about 2.9 miles of State highway around the Narrows Reservoir.

On May 19, 1992, the draft SRPA Loan Application Report and Environmental Report were submitted to Reclamation for review and comment.

On September 20, 1993, Reclamation released a draft environmental impact statement (DEIS) for public review and comment. Approximately 60 letters of comment were received from various Federal, State, and local agencies as well as members of the public. These comments and accompanying responses were included in the January 1995 final environmental impact statement (1995 FEIS).

On December 23, 1994, SWCD submitted the final Loan Application Report for processing. On January 23, 1995, Reclamation filed the 1995 FEIS with the United States Environmental Protection Agency (EPA).

On May 8, 1995, Reclamation's Upper Colorado Regional Director signed a Record of Decision (ROD). The ROD's recommendation was to proceed with the recommended plan identified in the 1995 FEIS.

On July 28, 1995, a Complaint was filed in United States Federal District Court, District of Utah, by the Carbon Water Committee, Utah Rivers Conservation Council, Utah Wilderness Association, and three individuals (Plaintiffs) against officials of the U.S. Department of the Interior (Interior), alleging that Reclamation failed to comply with the National Environmental Policy Act (NEPA) in preparing the environmental impact statement (EIS).

In response, Reclamation hired the Environmental Chemical Corporation (ECC), an environmental consultant, to conduct an independent review of the 1995 FEIS. ECC concluded that "the Narrows Project FEIS was complete and technically complied with NEPA, fulfilling most requirements of the Council on Environmental Quality (CEQ), Reclamation, and Department of the Interior guidelines."

In September 1995, a Civil Complaint was filed in the Sixth Judicial District Court of Sanpete County, State of Utah by SWCD (Plaintiff) against Carbon Water Conservancy District and Pacificorp, also known as Utah Power and Light (Defendants). The Plaintiffs alleged a breach of contract by the Defendants by willfully interfering and hindering the Plaintiff's attempts to develop its Gooseberry Creek water rights and construct the Narrows Project. In June 1999,

the court dismissed the suit, and SWCD appealed to the Tenth Circuit Court of Appeals of the United States. The court of appeals upheld the original district court ruling.

On September 11, 1995, Reclamation published a *Federal Register Notice* for rescission of the ROD on the 1995 FEIS for the Narrows Project, due to certain procedural errors in the final environmental impact statement (FEIS) process.

On February 8, 1996, Reclamation published a *Federal Register NOI* to prepare a new DEIS, wherein it announced that the new DEIS and subsequent FEIS would supersede the 1995 FEIS. Reclamation said it would use the 1995 FEIS, along with other materials submitted by SWCD, as the basis for preparing the new DEIS but would prepare the new EIS itself, rather than use a contractor.

Reclamation's new DEIS was published in March 1998. Comments were received by mail and at public hearings in Price and Mount Pleasant, Utah, on April 22 and 23, 1998, respectively.

The present document is a SDEIS developed through Reclamation's own analysis of the environmental impacts of the Proposed Action. A NOI to prepare this SDEIS was published in the *Federal Register* on November 25, 2003. Based on scoping results, discussions with interested parties and cooperating agencies, existing laws and regulations, and comments on the 1998 DEIS, Reclamation updated or added the hydrology, water quality, population and demographics, water usage, recreation, discussion regarding Skyline Mine water development, fisheries, project cost estimates, wetlands delineations, Wild and Scenic Rivers, and Endangered Species Act compliance in this SDEIS. Resources, issues, and concerns identified during the process of completing this SDEIS

were fully considered, and changes were made to this document as appropriate. Since Reclamation is publishing this SDEIS and providing for a new comment period, a formal response to comments received on the 1998 DEIS was not prepared.

Reclamation considers the historical tie between the enlargement of Scofield Reservoir and the transmountain diversion to Sanpete County to be relevant in evaluating the Narrows Project; therefore, the analysis includes references to the effects the enlargement of Scofield Reservoir has had on various resources.

1.4 PURPOSE AND NEED

Reclamation has received from SWCD its original application for a SRPA loan to build the Narrows Project and a request for authorization to use withdrawn lands to construct and operate the proposed dam and reservoir. Reclamation will receive an updated application for evaluation; and, in addition, Reclamation will complete NEPA compliance. SWCD's stated purpose and need in making its application to Reclamation serve to clarify and disclose the environmental effects of the proposed use of Federal funds and lands.

The primary purpose of the Narrows Project is to enable SWCD to develop an irrigation and M&I supply source for users in north Sanpete County, Utah, whereby the average annual shortages to irrigators in the project area might be reduced as nearly as possible to 5 percent (%), which is considered full irrigation supply for Reclamation projects. Specifically, the following are water related needs addressed by the proposed project:

- ◆ Demand for municipal water for present and future use exceeds the currently available supply. The proposed Narrows Project would develop, through exchange,

an additional supply of municipal water to offset current shortages and accommodate anticipated population growth in the project area.

- ◆ The current water supply for agricultural irrigation does not provide adequate supply and storage at the times when it is needed—typically in July, August, and September of each year. The proposed Narrows Project would provide late season irrigation water to offset at least some of the current shortages.
- ◆ The Narrows Tunnel in Sanpete County needs to be rehabilitated and improved to maintain and enhance its dependability and capability to deliver water to Sanpete County users. The proposed Narrows Project would include such rehabilitation work to prevent failure of the tunnel and ensure its continuing usefulness.

In addition to the primary purpose of supplying water to Sanpete County, the project would have the additional benefit of providing improved and additional recreation and fishery opportunities in Sanpete County.

For purposes of complete analysis and potential impacts of this project, a broad range of alternatives has been evaluated thoroughly to fully comply with NEPA requirements. Reclamation’s release of this Supplemental Draft EIS does not imply either approval or denial of the SRPA loan application or the request for authorization to use withdrawn lands.

1.4.1 Additional Municipal Irrigation and Culinary Water Supply

Rule 309-203 of the Utah Administrative Code identifies minimum sizing requirements for a public drinking water system facility. Specifically, R309-203-7 requires that water sources “shall legally and

physically meet water demands. . .” The rule then indicates amounts of water that are to be provided for indoor and outdoor use. For a public drinking water system to comply with this regulation, the system must demonstrate that the specified source capacity is available.

Based on the average household and lot size in the north Sanpete County area, a total water supply of about 270 gallons per capita per day (GPCD) is required.

Cities within the project area include Fairview, Mount Pleasant, Spring City, and Moroni. To comply with the State code, each of these cities has two water systems—a culinary system that is designed to satisfy indoor demands and an irrigation system that is designed to satisfy outdoor demands.

This practice allows the limited supply of high quality water to be used for culinary purposes and untreated surface water to be used for outdoor irrigation of lawns and gardens.

The United States Geological Survey (USGS) has completed a water use trends study in the desert Southwest, and its 2000 per capita water use data are shown in figure 1-1.

According to these data, Utah has the second highest per capita culinary water use in the region at 293 gallons per day. This is approximately 0.33 acre-foot per year. The United States average is lower than in the desert Southwest, mainly because precipitation received in most other States is enough to make outside watering unnecessary.

To check the validity of the above estimate of 270 GPCD, recent per capita water use data collected for the Wasatch Front area to use in State Water Plan Basin Reports were examined. Approximately 80% of Utah’s population lives in the Wasatch Front drainage basins. These basins include Weber River, Jordan River (Salt Lake County), and

Utah Lake drainage areas. Municipal use per capita in the Wasatch Front drainage basins

for residential, commercial, and institutional uses is shown in tables 1-1 and 1-2.

Table 1-1.—Current per Capita Culinary and Secondary Use Values for Wasatch Front Drainage Basins

Culinary per Capita Use						
County	Residential Use		Commercial, Institutional, and Industrial		Total Culinary Use	
	acre-ft/yr¹	GPCD	acre-ft/yr	GPCD	acre-ft/yr	GPCD
Weber Basin					0.220	197
Summit	0.252	225	0.058	52	0.310	277
Morgan	0.261	233	0.029	26	0.290	259
Weber	0.127	113	0.102	91	0.229	204
Davis	0.114	102	0.088	79	0.203	181
Jordan Basin					0.280	250
Salt Lake	0.198	177	0.082	73	0.280	250
Utah Lake					0.245	218
Utah	0.160	143	0.084	75	0.244	218
Juab	0.181	162	0.072	64	0.253	226
Wasatch	0.199	178	0.049	44	0.249	222
Average overall use	0.171	153	0.085	76	0.256	228
Secondary per Capita Use						
County	Residential Use		Commercial, Institutional, and Industrial		Total Secondary Use	
	acre-ft/yr	GPCD	acre-ft/yr	GPCD	acre-ft/yr	GPCD
Weber Basin					0.147	131
Summit	0.050	45	0.036	32	0.086	77
Morgan	0.045	40	0.000	0	0.045	40
Weber	0.141	126	0.019	17	0.160	143
Davis	0.129	115	0.016	14	0.145	129
Jordan Basin					0.011	10
Salt Lake	0.006	5	0.006	5	0.011	10
Utah Lake Basin					0.063	56
Utah	0.046	41	0.017	15	0.063	56
Juab	0.040	36	0.006	5	0.046	41
Wasatch	0.058	52	0.025	22	0.083	74
Average overall use	0.048	43	0.012	10	0.059	53

¹ acre-ft/yr = acre-feet per year.

Table 1-2.—Summary of Current Culinary and Secondary per Capita Water Use for the Wasatch Front Drainage Basins

County	Culinary and Secondary per Capita Use					
	Residential Use		Commercial, Institutional, and Industrial		Total Culinary and Secondary Use	
	acre-ft/yr	GPCD	acre-ft/yr	GPCD	acre-ft/yr	GPCD
Weber Basin					0.367	328
Summit	0.302	270	0.094	84	0.397	354
Morgan	0.306	273	0.029	26	0.335	299
Weber	0.268	239	0.121	108	0.389	347
Davis	0.243	217	0.104	93	0.347	310
Jordan Basin					0.291	260
Salt Lake	0.204	182	0.087	78	0.291	260
Utah Lake					0.307	274
Utah	0.206	184	0.101	90	0.307	274
Juab	0.222	198	0.077	69	0.299	267
Wasatch	0.258	230	0.074	66	0.332	296
Average overall use	0.219	195	0.096	86	0.315	281

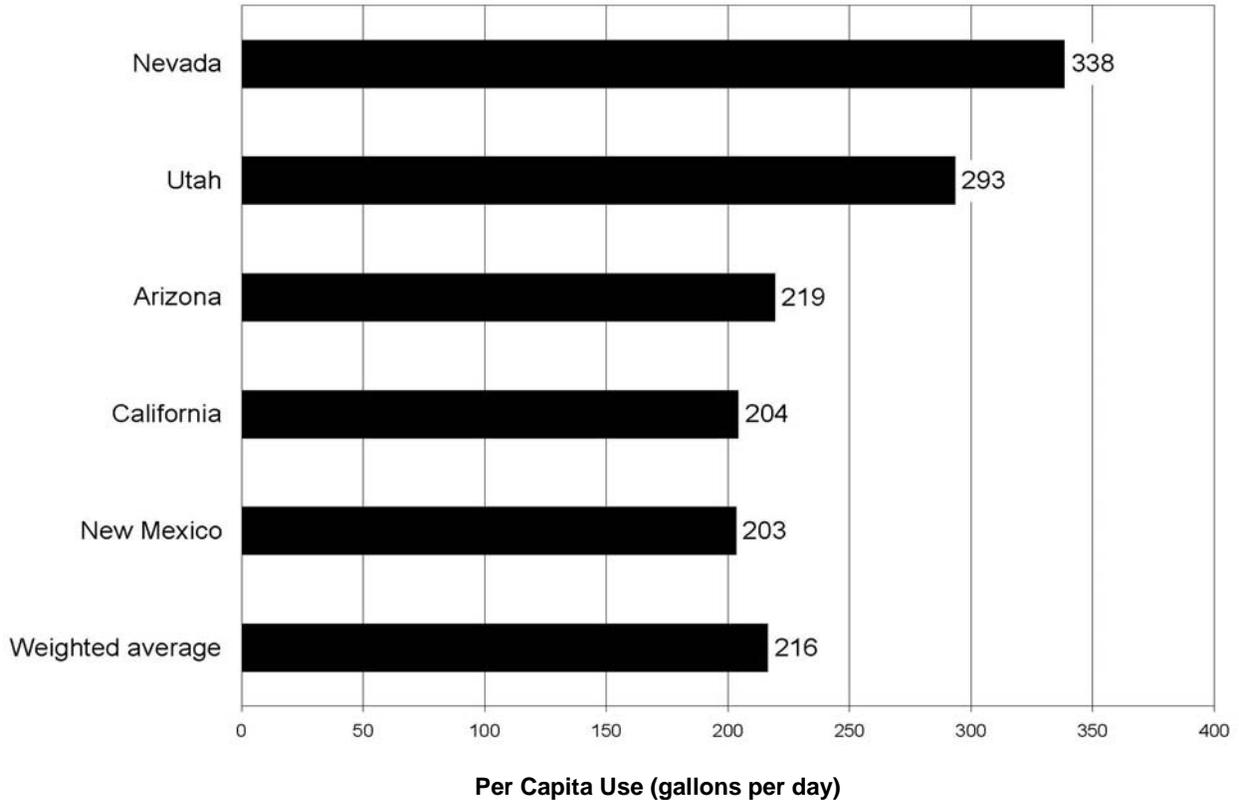


Figure 1-1.—2000 per Capita Water Use of Public Supply Water in Arizona, California, Nevada, New Mexico, and Utah.

Table 1-1 shows the culinary (potable) per capita water uses that include private domestic use as well as public water supply use. The overall culinary water use for the Wasatch Front is 228 GPCD. Specific per capita water consumption data for Sanpete County is not available; therefore, regional information was used. Conditions in Sanpete County are very similar to those generally on the Wasatch Front, so water need could be assumed to be similar to that on the Wasatch Front. However, due to the recurrent shortages in Sanpete County, it is most likely that Sanpete County's usage is lower than the State average.

The secondary (nonpotable) municipal per capita use, also listed in table 1-1, shows that the Weber River Basin uses the largest amount of secondary water. Total municipal use of secondary water is 53 GPCD compared to 228 GPCD for culinary water. Likewise, overall municipal per capita use of culinary and secondary water is 281 GPCD, shown in table 1-2. The residential portion of the total municipal use is 195 GPCD (69%). Commercial and institutional use is 86 GPCD (31%).

Mount Pleasant's irrigation system has a total of 948 shares. The city has a 2005 estimated population of 2,938. Each share of water provides a supply of about 0.45 acre-foot, which is equivalent to a supply of 0.15 acre-foot per capita. The agricultural irrigation systems in the area experience shortages of about 29.5% (average). Since the city's irrigation system is linked to the same water source as the agricultural system, it too would experience the same 29.5% shortage. Therefore, municipal irrigation shortages are estimated to be 0.044 acre-foot per capita (29.5% of 0.15 acre-foot per capita). Applying this per capita shortage to all four cities, which have a combined population of 6,624, the total municipal irrigation shortage is estimated to

be 290 acre-feet per year. To offset this shortage, local residents use potable water for some portion of irrigation needs.

The population in the project area is expected to increase, and the current shortages of municipal water are expected to worsen in these north Sanpete County communities. Based on growth projections developed by the Utah Office of Planning and Budget, the population within the project area is expected to increase by about 4,960 residents from 2000 to 2050 (table 1-3). As shown in table 1-4, this population growth would result in an increased municipal water demand of about 1,240 acre-feet annually. However, local officials believe that the State projections underestimate the anticipated population growth. During the past several years, the average population growth in north Sanpete County has been greater than 3% per year and greater than the State's projections. Table 1-5 shows the anticipated population growth based on an average 3% growth rate.

As shown in table 1-5, with a 3% growth rate, the population within the project area would increase to 18,275 by 2030, an increase of about 10,750 residents. Table 1-6 shows that, with 3% annual population growth, the demand for municipal water would increase to 5,528 by 2030, an increase of more than 3,250 acre-feet per year. With existing shortages and anticipated population growth, there would be a demand for an additional 3,550 acre-feet of municipal water by the year 2030.

1.4.2 Additional Agricultural Irrigation Water Supply

The existing water supply for agricultural irrigation does not provide an adequate supply at the times when it is needed. An additional and dependable irrigation water supply is needed to stabilize and improve the agricultural component of the Sanpete

**Table 1-3.—Population Projections for Narrows Project Area ^{1, 2}
Based on State of Utah Economic Demographic Projections – 2005**

Population								
Year	Average Annual Population Growth	Fairview	Mt. Pleasant	Moroni	Spring City	Wales	Unincorporated Counties ³	Total Project Area
2000		1,160	2,707	1,280	956	219	1,207	7,529
2005	1.9%	1,257	2,938	1,392	1,037	244	1,389	8,257
2010	1.9%	1,378	3,222	1,527	1,137	267	1,523	9,054
2020	1.7%	1,625	3,799	1,800	1,340	315	1,795	10,674
2030	0.7%	1,738	4,062	1,925	1,433	337	1,920	11,415
2040	0.5%	1,821	4,256	2,017	1,502	353	2,012	11,961
2050	0.4%	1,901	4,444	2,106	1,568	369	2,100	12,488

¹ 2000 populations are April 1 U.S. Census populations; all others are July 1 populations.

² County populations for 2005–2050 from the Governor's Office of Planning and Budget.

³ Unincorporated county estimates are prorated based on the total unincorporated estimates.

Table 1-4.—Projected Municipal Water Demands for Narrows Project Area Based on 270 GPCD and State of Utah Economic Demographic Projections – 2005

Acre-feet per Year							
Year	Fairview	Mt. Pleasant	Moroni	Spring City	Wales	Unincorporated Counties	Total Project Area
2000	351	819	387	289	66	365	2,278
2005	380	889	421	314	74	420	2,498
2010	417	975	462	344	81	461	2,739
2020	492	1,149	545	405	95	543	3,229
2030	526	1,229	582	433	102	581	3,453
2040	551	1,287	610	454	107	609	3,618
2050	575	1,344	637	474	112	635	3,778

Table 1-5.—Population Projections for Narrows Project Area Based on County Projections on Annual Growth Rate of 3%

Population								
Year	Average Annual Population Growth	Fairview	Mt. Pleasant	Moroni	Spring City	Wales	Unincorporated Counties	Total Project Area
2000		1,160	2,707	1,280	956	219	1,207	7,529
2005	3.00%	1,345	3,138	1,484	1,108	254	1,399	8,728
2010	3.00%	1,559	3,638	1,720	1,285	294	1,622	10,118
2020	3.00%	2,095	4,889	2,312	1,727	396	2,180	13,598
2030	3.00%	2,816	6,571	3,107	2,320	532	2,930	18,275
2040	3.00%	3,784	8,830	4,175	3,119	714	3,937	24,560
2050	3.00%	5,085	11,867	5,611	4,191	960	5,291	33,006

Table 1-6.—Projected Municipal Water Demands for Narrows Project Area Based on 270 GPCD and Annual Growth Rate of 3%

Acre-feet per Year							
Year	Fairview	Mt. Pleasant	Moroni	Spring City	Wales	Unincorporated Counties	Total Project Area
2000	351	819	387	289	66	365	2,278
2005	407	949	449	335	77	423	2,640
2010	472	1,100	520	389	89	491	3,061
2020	634	1,479	699	522	120	659	4,113
2030	852	1,988	940	702	161	886	5,528
2040	1,145	2,671	1,263	943	216	1,191	7,429
2050	1,538	3,590	1,697	1,268	290	1,601	9,984

County economy. Successful crop production in north Sanpete County depends on irrigation because the average rainfall during the growing season is approximately 4 inches. The present irrigation water supply consists primarily of runoff from the previous winter snowpack. The amount of annual runoff varies widely because of natural precipitation patterns during the winter. The greatest volume of runoff occurs in the early part of the growing season. Although irrigation water users have made numerous improvements to their existing water distribution systems in the past (such as canal lining, piped distribution systems, and conversion to sprinkler irrigation), water shortages still occur (often exceeding 50% in dry years and 30% in average years).

There are about 23,180 acres of irrigated farmland in the project area. Of that acreage, 15,420 acres have been identified as eligible to receive project water. The eligible lands are classified as Class I, II, or III lands according to Reclamation’s land classification system. The remaining lands are considered Class VI (ineligible) lands because of poor soil, inadequate drainage, or topographic characteristics.

In determining water requirements, the project lands were divided into three groups

representing similar water supplies and irrigation practices. These groups are described below.

Group 1 lands include the areas serviced by the Cottonwood-Gooseberry, Birch Creek, Spring Canyon, North Creek, Pleasant Creek, and Oak Creek Irrigation Companies. Of the 9,777 acres of presently irrigated lands, 5,705 acres are eligible to receive project water. Water is delivered to Group 1 lands through pipeline systems. These lands currently are irrigated by sprinkler systems.

Group 2 lands include the areas served by the Horseshoe, Cedar Creek, and Twin Creek Irrigation Companies. Group 2 contains 6,407 acres of farmland, of which 4,644 acres are eligible to receive project water. Water is delivered to these lands through open canals and ditches. At present, these lands mostly are flood irrigated.

Group 3 lands use the San Pitch River as their principal water supply and are served by numerous irrigation companies. There are 6,996 acres of irrigated land in this group, 5,071 acres of which are eligible for project water. Group 3 lands receive water through open canals and ditches. These lands currently are irrigated with a combination of flood and sprinkler methods.

Principal crops grown in the project area include pasture, alfalfa, grass hay, and small grains. Consumptive use requirements reported in the DEIS and earlier documents were determined for these crops using the modified Blaney-Criddle method as summarized in the Soil Conservation Service publication, *Technical Release No. 21, Irrigation Water Requirements*, April 1967, revised September 1970. The Utah Agricultural Experiment Station has since released updated consumptive use data in its publication, *Consumptive Use of Irrigated Crops in Utah*, October 1994 (*Research Report 145*). The consumptive use requirements presented here are based on the 1994 data and are higher than previous estimates.

Consumptive use estimates were computed for the principal crops found in each of the groups. The estimates are based on the crop distribution of each group. Average monthly estimates were computed for April through October, as appropriate for each crop. These estimates represent net irrigation requirements since *Research Report 145* deducts effective precipitation from total consumptive use. Curve No. 1 (crop consumptive use), shown in figure 1-2, presents the monthly net irrigation requirements for the 15,420 acres of project-eligible lands. The average net irrigation requirement is approximately 30,400 acre-feet per year.

The net irrigation requirement is the amount of water that must be artificially applied by irrigation and must be present in the root zone and available for evapotranspiration by the plants for normal plant growth and development. It is not the amount that must be diverted into the irrigation system. Because of inevitable inefficiencies of the delivery, distribution, and application systems, a larger quantity of water must be diverted into the irrigation system to meet

actual crop needs. Some of the factors contributing to these inefficiencies include seepage and evaporation from the carriage system, evaporation of applied water, deep percolation of excess applied water, and runoff of excess water. The lack of uniformity in applying irrigation water is the major cause of deep percolation and runoff. Traditionally, flood irrigation is the least uniform, and microirrigation systems are the most uniform. The application systems with the highest uniformity generally also have the highest capital and operating costs. Based on the delivery system conditions and application methods in use, the diversion requirement was computed to be an average of about 62,900 acre-feet per year for the project-eligible lands. This demand is shown as Curve No. 2 (diversion demand without efficiency improvements) in figure 1-2.

Data gathering efforts, conducted during the planning stages of the project, identified private parties and canal companies that were planning to install, or were currently installing, a variety of efficiency improvements (efficiency improvement, conservation measures). These improvements consist mainly of pipe delivery and sprinkler irrigation systems. More precise application methods, such as drip irrigation and microspray systems, are not cost effective. These efficiency improvements are expected to be in place by the time project water would become available. Thus, all calculations of project diversion demands made and discussed herein are based on the increased efficiencies produced by these improvements.

Curve No. 3 (diversion demand with efficiency improvements) in figure 1-2 shows the reduced diversion requirement (or demand) of 51,700 acre-feet per year on the average. The efficiency improvements would result in an 11,200-acre-foot reduction in the diversion demand. It should be

Demand and Supply

Pre-Project Conditions

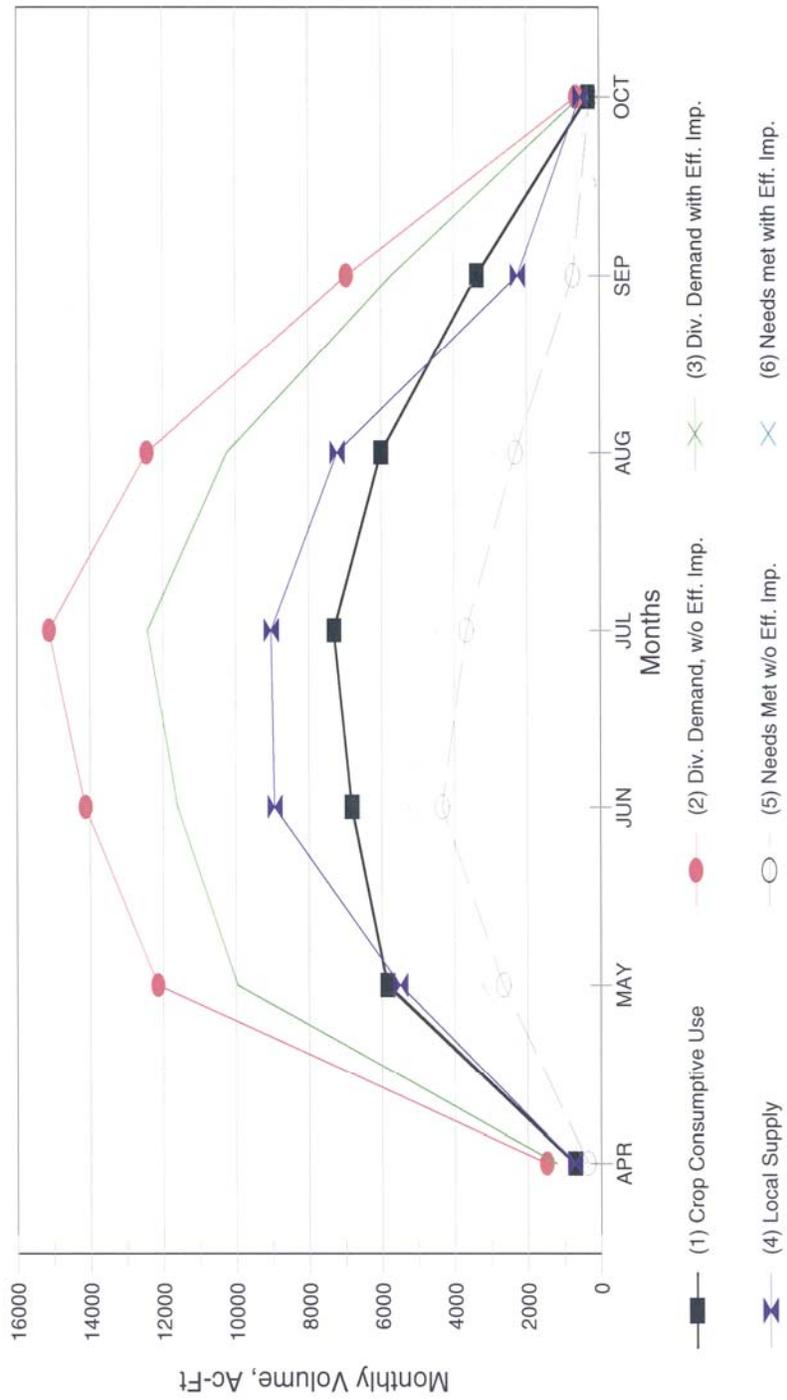


Figure 1-2.—Narrows Project Demand and Supply, Preproject Conditions.

emphasized that the reduced diversion requirement is the effect efficiency improvements would have, not a development of a new water supply. The same irrigated lands require less in physical diversion to receive full irrigation. The efficiency improvements also will mean that a larger percentage of diverted water would become available for plant evapotranspiration.

Local water supplies in the project area consist of a small amount of effective precipitation during the growing season, a small amount of storage, and direct runoff from the snowpack. Curve No. 4 (local supply) in figure 1-2 shows the 34,200 acre-feet (spread over the irrigation season) diverted annually to meet the crop water needs. Curve No. 4 is based on long-term historical diversions. It does not include effective precipitation, which is already accounted for in the net irrigation requirement shown in Curve No. 1. As can be seen from figure 1-2, the local supply is considerably less than the reduced diversion demand (Curve No. 3). This shortage is approximately 17,500 acre-feet on an average annual basis (total volume difference between Curve Nos. 3 and 4).

Research Report 145 indicates that about 3.5 inches of effective precipitation occur during the nongrowing season. Some portion of this effective precipitation would accumulate in the root zone and be available to augment the local supply during the first few weeks of the growing season. There could be as much as 4,500 acre-feet of moisture stored in the soil profile at the beginning of the growing season.

The exact amount of soil moisture has not been determined. In reality, the shortage, therefore, most likely would range between 13,000 and 17,500 acre-feet per year. Assuming that one-half of this precipitation still would be in the root zone at the

beginning of the growing season, the average shortage would be about 15,250 acre-feet per year. This represents a 29.5% shortage relative to the diversion demand.

Depending on the efficiency scenario being examined (with or without efficiency improvements), Curve Nos. 5 (needs met without efficiency improvements) and 6 (needs met with efficiency improvements) show that significant soil moisture deficits would occur throughout much of the growing season. With the expected moisture available in the root zone at the beginning of the growing season, the early-season deficits probably would not be as severe, as shown by the graphs. However, serious soil moisture deficits occur throughout much of the latter part of the growing season. This would result in prolonged or frequent water stress for the crops involved. Consequences of this water stress include reduced crop yield, reduced quality, and poor plant vigor. For example, there should be three good cuttings of alfalfa under adequate water supply conditions. Currently, the first cutting is good, the second is mediocre, and the third generally never occurs. Further, evidence of reduced crop vigor was noted during a Reclamation field tour of the project service area. A large number of fields were noted to have unusually high infestations of weeds. Typically, lower water-use weeds quickly infest a field when the crop is seriously water stressed. This problem is exacerbated in north Sanpete County because the short water supply prevents normal crop rotations that help control weeds and maintain field productivity (because rotation crops have higher water requirements).

As previously noted, only a portion of the water diverted for irrigation would be available for crop use. The remaining portion would be lost through evaporation, seepage losses, deep percolation, and runoff. Except for the amount lost through

evaporation, these losses either become part of the water supply for the shallow water table or become return flows to the natural surface streams. These losses support wetlands and aquatic habitat and become part of the water supply for downstream users. Total losses from local supplies would amount to an estimated 17,600 acre-feet per year before efficiency improvements were implemented. The losses would be expected to be reduced to about 14,100 acre-feet per year with implementing efficiency improvements. Thus, efficiency improvements would result in a combined loss reduction of about 3,500 acre-feet per year.

1.4.3 Narrows Tunnel Rehabilitation

The poor condition of the existing Narrows Tunnel threatens the ability to deliver the existing water supply. The 3,100-foot-long Narrows Tunnel was constructed in 1964 to divert water from Gooseberry Creek to Cottonwood Creek and to the Fairview area for irrigation. It was designed to be concrete-lined and also serve as the outlet for the proposed Narrows Reservoir. Since its construction more than 30 years ago, the tunnel has experienced severe stability problems. Steel sets with wooden lagging were installed in certain reaches of the tunnel to provide additional reinforcement. However, the steel sets were widely spaced, and loose rubble from within the tunnel significantly loaded the wooden lagging between sets. As time passed, the lagging began to fail, permitting the roof and rib to slough over significant portions of the tunnel. In the early 1980s when it became evident that the tunnel could eventually collapse, a 36-inch corrugated metal pipe (CMP) was installed through the least stable tunnel sections to maintain the waterway. This

measure is considered to be temporary because the CMP eventually will collapse due to rust or excessive earth loads.

1.4.4 Recreation and Fishery Opportunities

In addition to the primary purpose of supplying water to Sanpete County, the proposed project would result in improved and additional recreation and fishery opportunities in Sanpete County. The recreation demand is increasing rapidly in the project area. The most popular outdoor recreational activities in Utah are fishing, boating, swimming, water skiing, camping, picnicking, hunting, and horseback riding. Boating ranks as one of the most popular outdoor recreation activities in the State of Utah. However, adequate flatwater boating and boat launching areas currently are not available in Sanpete and Carbon Counties. This need was included in the top 10 recreation issues in Utah identified in public meetings conducted by the Utah Division of Parks and Recreation in 1985 and 1990. The 1992 Utah State Comprehensive Recreation Plan (SCORP) states that:

“As Utah’s population continues to grow, so does the demand for recreation facilities and opportunities. Obviously, the recreation system in place in 1970 or even 1980 is no longer adequate in the 1990s.”

The SCORP suggests that additional water-based recreation areas are needed to accommodate the potential growth in demand for recreation use throughout the State.

In identifying priorities for recreation development, the SCORP states that:

“Generally, those projects in or near major urban and rural service

centers would rank higher, particularly if they were water-related with multiple uses”

According to the Utah Division of Parks and Recreation, the most popular outdoor recreation activity in Utah is fishing.

The 1986 Forest Land and Resource Management Plan for the Manti-La Sal National Forest (Forest Plan) states that:

“. . .the demand for developed recreation sites is expected to triple over the next 50 years. At this rate, demand on the Manti-La Sal National Forest is expected to exceed supply at some sites starting in the year 1990.”

The Forest Plan also states that:

“Some lands, especially those next to reservoirs on the Forest, possess a high recreational value.”

1.5 RELATIONSHIP TO OTHER PROJECTS

The Bonneville and Great Basins and the Upper Colorado River Basin have been the subject of several projects, plans, and programs. Construction and operation of the proposed project would reflect consideration of, and cooperation with, the following existing projects.

1.5.1 Central Utah Project

As part of the master water development plan for Sanpete County, the Narrows Project is intended to provide a supplemental water supply for the northern part of the county. Central Utah Project (CUP) water, delivered by the Sevier River, originally was planned to provide a supplemental supply for the southern portion of the county. However, The Central Utah Project Completion Act

(CUPCA), which authorized completion of the remaining features of the CUP, restricted CUP development to the Wasatch Front area of central Utah if construction of facilities did not begin within 5 years of the enactment of the legislation. Sevier and Millard Counties withdrew from the Central Utah Project, and plans to deliver CUP water to the Sevier River Basin have been dropped. The 5-year authorization window has since expired; therefore, delivery of CUP water to the Sevier River Basin and, consequently, to Sanpete County, will not occur.

To compensate for the CUP water supply loss, Section 206 of the CUPCA was designed to provide some funding for supplemental projects in Sanpete County. Section 206 is intended for counties within the Central Utah Water Conservancy District (CUWCD) that were originally planned to receive CUP water but will not (as explained above). These counties are eligible to receive a rebate of the taxes paid to the CUWCD. This rebate may be used for local water projects such as potable water distribution and treatment, wastewater collection and treatment, and agricultural water management. Participating counties will receive a rebate from the CUWCD of ad valorem tax contributions paid, with interest, but less any benefits or administrative expenses. Under Section 206, this rebate represents a 35% local cost share; and a Federal grant from the Secretary of the Interior constitutes the remaining 65% of the project cost.

Through 1996, Sanpete County had paid nearly \$2.4 million in ad valorem taxes to the CUWCD, which established the maximum amount of the rebate under CUPCA Section 206. Based on a 65% match, the corresponding amount of matching Federal grant money is about \$4.4 million. These two sums provide a total Section 206 amount of \$6.8 million

that could be used to fund water development/conservation projects in Sanpete County.

To more effectively utilize these funds, in June 2000, SWCD completed the Sanpete County Water Resources Master Plan (Master Plan) for managing, developing, and conserving the limited water resources of the county. The plan was intended to evaluate and prioritize several water management and/or conservation projects that potentially would be funded by SWCD for implementation. The Master Plan clearly places the Narrows Project as its primary objective in obtaining supplemental water to meet shortages in north Sanpete County. However, other water development/conservation projects would be needed to further alleviate shortages that occur throughout Sanpete County. Since 1996, Sanpete County has approved approximately \$4.8 million in projects to further develop/conservate its water resources using CUPCA Section 206 funds.

1.5.2 Scofield Project

The Scofield Project, authorized on June 24, 1943, arose out of the remnants of various private dams that either failed or never lived up to expectations. The new Scofield Dam and Reservoir replaced the rapidly deteriorating, old Scofield Dam, built by the Price River Water Conservation District. The Scofield Project eventually irrigated area lands originally that were to be served by Mammoth Dam, and later by the defunct Gooseberry Project. Mammoth Dam failed in 1917, before its completion. While the Scofield Project evolved out of the Gooseberry Project, the need to protect vital rail lines from flood damage during World War II was a key to construction of Scofield. Although World War II prompted suspension of construction on most Reclamation projects, the fear that the existing Scofield

Dam might fail and cause millions of dollars of damage and disrupt transportation influenced the Federal Government to proceed with the Scofield Project.

The Scofield Project included 30,000 acre-feet of replacement storage capacity (replacing the then existing 30,000-acre-foot structure), 8,000 acre-feet of inactive or dead pool storage (conservation pool), and 35,000 acre-feet of exchange capacity to support the transmountain diversion of Gooseberry Creek water at or near the Narrows damsite. The near doubling in size of Scofield Reservoir was originally accomplished (1943–1946) because of hazardous conditions with the existing structure, the threat it posed to the war effort, and the reservoir's role in accomplishing a portion of the Gooseberry Project Plan, which included an early version of the Narrows Project.

1.5.3 Fairview Lakes, Gunnison Reservoir, Wales Reservoir

Through a proposed operating agreement associated with the Narrows Project, releases would be made from the privately owned Fairview Lakes to re-establish minimum instream flows in two small tributaries to Gooseberry Creek above the Narrows Reservoir site (see frontispiece map). Wales Reservoir is a small, privately owned reservoir that stores winter runoff from the Upper San Pitch River drainage. Gunnison Reservoir is a storage facility, located southwest of Manti, that stores water from the San Pitch River drainage (Wales Reservoir is located about 19 miles upstream of Gunnison Reservoir on Silver Creek, which is a tributary of the San Pitch River).

1.5.4 Price-San Rafael Rivers Unit, Colorado River Salinity Control Program

The Price-San Rafael Rivers Unit of the Colorado River Water Quality Improvement Program under the Colorado River Salinity Control Act would reduce salt contribution to the Colorado River by about 161,000 tons annually through a system of on-farm and off-farm irrigation improvements. The Narrows Project would divert water from the Price-San Rafael River Basins to develop a supplemental irrigation water supply of 5,400 acre-feet per year for municipal use and for approximately 15,420 acres of presently irrigated land in north Sanpete County, Utah. The Price-San Rafael Rivers Unit more than compensates for the trans-basin diversion of 5,400 acre-feet under the Narrows Project.

1.5.5 Upper Colorado River Endangered Fish Recovery Program

A coalition of agencies and organizations came together in 1988 to recover endangered Colorado River Basin fish and provide for future water development for agricultural, hydroelectric, and municipal uses.

Called the Recovery Implementation Program (RIP) for Endangered Fish Species in the Upper Colorado River (Recovery Program), this effort involves Federal, State, and private organizations and agencies in Colorado, Utah, and Wyoming. The Recovery Program complies with all applicable laws, including the Federal Endangered Species Act, State water laws, river laws, and interstate water compacts.

Recovery strategies include conducting research, improving river habitat, providing adequate streamflows, managing nonnative fish, and raising endangered fish in

hatcheries for stocking. Ongoing activities include the development of recommended flow regimes for the Price River to benefit endangered fish populations. As of August 2009, the Recovery Program is in the final stages of developing these flow recommendations.¹

1.6 DECISIONS TO BE MADE BASED ON THIS ANALYSIS

Based on the analysis documented in this SDEIS, the responsible official for Reclamation will make the following decisions:

- ◆ Whether Reclamation should approve SWCD's application for a SRPA loan to construct the Narrows Project
- ◆ Whether Reclamation should approve SWCD's use of Reclamation withdrawn lands for the Narrows Project, in accordance with Reclamation law
- ◆ Under what terms and conditions (of a local supplemental agreement between Reclamation and the USDA Forest Service) should the agencies administer resources within the total areas of project influence

In addition, the cooperating agencies may use this SDEIS to aid them in making the following decisions:

- ◆ Whether the USDA Forest Service should:
 1. Amend the Forest Plan to reflect Narrows Project land use changes
 2. Authorize mitigation measures on USDA Forest Service

¹ <http://www.coloradoriverrecovery.org/general-information/about.html>.

administered lands outside the Reclamation withdrawn lands

3. Issue necessary easements to the Utah Department of Transportation (UDOT) for relocating State Route (SR) 264
 4. Accept responsibility for management of the recreation facilities
 5. Sign various agreements, such as memoranda of understanding (MOU), easements, and rights-of-way (ROW)
 6. Amend grazing permits and allotment management plans
- ◆ Whether USACE should approve SWCD's application for a Clean Water Act Section 404 permit authorizing the placement of discharged dredge or fill material into waters of the United States for constructing the Narrows Dam and other features of the Narrows Project

1.7 ENVIRONMENTAL ISSUES ASSOCIATED WITH THE PROPOSED ACTION ALTERNATIVE

The issues identified through the initial scoping effort are listed below. The issues are phrased as questions. Following a brief description of the issue, indicators or measures are suggested that may be used to compare how the alternatives answer the question. Indicators measure change from the present condition. Chapter 2 contains a comparison summary of the alternatives and their responses to the issues. Chapter 3 presents the affected environment and the predicted effects as they relate to the resource issues.

Issue No. 1 – How would threatened and endangered species be affected by the Narrows Project?

The project area and potentially affected offsite areas contain the habitat for several federally listed endangered and threatened species, including the Colorado pikeminnow, bonytail, humpback chub, razorback sucker, Canada lynx, Utah prairie dog, black-footed ferret, yellow-billed cuckoo, southwestern willow flycatcher, heliotrope milk-vetch, Graham beard tongue, and the Uinta Basin hookless cactus. Due to the listing of these species as threatened, endangered, candidate, or proposed, the protection of a sensitive species habitat has become a matter of concern to the U.S. Fish and Wildlife Service (Service) and to the public.

Indicators for this issue:

- ◆ Acre-feet of water annually depleted from the Colorado River system
- ◆ Loss of potential southwestern willow flycatcher habitat

Issue No. 2 – How would the Narrows Project affect wildlife resources?

The project area provides habitat for a wide variety of wildlife species ranging from deer and elk to birds and small mammals. There is concern that the proposed project may disrupt the migration routes and feeding areas for some small animal and bird species, including some neotropical species.

Indicators for this issue:

- ◆ Number of habitat units lost for specific indicator wildlife species (i.e., ungulates, small mammals, neotropical migrants, and Utah State sensitive species)

Issue No. 3 – What effects would there be on water resources from the Narrows Project?

The public expressed concerns about the hydrology, water yield, and supply of the Price River as well as whether the winter releases and instream flows from Scofield Reservoir would be affected as a result of current or future use.

Indicators for this issue:

- ◆ Acre-feet of depletion from the Price River drainage
- ◆ Acre-feet of water available to San Pitch River drainage

Issue No. 4 – How would the Narrows Project affect the fishery resource?

The public expressed concern about the loss of Yellowstone cutthroat trout spawning habitat caused by inundation from the Narrows Project. Changes in the flow regime may cause increased water quality problems and subsequently affect the fisheries.

Concern for the fishery below Scofield Reservoir was expressed, and the question was asked if instream flows would be altered and if minimum flows would be required below Narrows Dam and Scofield Dam.

Indicators for this issue:

- ◆ Percent change in weighted usable area in fish habitat as measured by instream flow incremental methodology (IFIM)²
- ◆ Change in surface area in Scofield Reservoir
- ◆ Change in species composition above, below, and within Scofield Reservoir and the proposed reservoir

- ◆ Change in species composition and in population dynamics of existing species

Issue No. 5 – How would water quality be affected by the Narrows Project?

Accelerated sedimentation (over natural levels of sediment production) is the most likely factor to affect water quality. Land-disturbing activities, such as road construction and dam building, usually increase sedimentation, at least in the short term.

Concerns were expressed over how the Proposed Action may affect the water quality as measured by phosphorus loading downstream.

The addition of many new recreationists to the Gooseberry Valley could create additional pollution from problems with trash and sewage. Additionally, road material (from rerouting SR-264) may have a temporary and adverse effect on riparian systems.

Indicator for this issue:

- ◆ Change in average phosphorus level in Scofield Reservoir based on external phosphorus loading

Issue No. 6 – What would the effect be on wetland resources from the Narrows Project?

Construction of the Narrows Project would inundate existing wetlands. Change in flow (decrease or increase) may change the composition and structure of other existing wetlands.

Indicators for this issue:

- ◆ Acres of wetlands lost (function and value)

² IFIM is a standard for measuring habitat.

- ◆ Function and values measured by habitat evaluation procedures (HEP) analysis in terms of habitat units
- ◆ Change in species composition in wetland habitats

Issue No. 7 – What would the effect be on aquatic and riparian resources from the Narrows Project?

Construction of the Narrows Project would inundate and affect wetlands and riparian areas. A decrease in flow may change the wetlands and lower the water table. High flows are needed to re-establish the riparian communities. Concern was expressed about the possibility of high peak flows causing a blowout of the stream channel (Cottonwood Creek).

Indicators for this issue include:

- ◆ Change in species composition in aquatic and riparian habitats
- ◆ Number of miles of stream lost due to inundation of the reservoir
- ◆ Number of miles of stream affected by increase in flow and decrease in flow

Issue No. 8 – How would the Narrows Project affect the recreation and visual resources within the project area?

Currently, the area receives light, nonmotorized, dispersed recreation during the summer and fall, primarily from stream anglers. Moderate levels of winter recreation also occur. If the project is implemented, the nature of the recreational experience may be affected. Motor boating and related water sports, overnight family camping, large group reservation camping, all terrain vehicle (ATV) use, and reservoir fishing activities may replace the current recreation experience in the area inundated by the reservoir.

The surrounding USDA Forest Service lands in this area have been designated by the Forest Plan to have the visual quality objective (VQO) of Partial Retention. One concern is that, with developing the recreational area, associated gravel pits and soil scars may affect the visual quality of the area.

Indicators for this issue:

- ◆ Increase in developed recreation visitor days at Narrows (including fishing)
- ◆ Increase in dispersed recreation visitor days at Narrows (including fishing)
- ◆ Change in projected fisherman days
- ◆ Change in VQOs

Issue No. 9 – What effect would there be on cultural resources from the Narrows Project?

A Class III cultural resource inventory was conducted for the proposed Narrows Dam and Reservoir pool area in 1979 (Dames & Moore). Prior to beginning the Class III inventory, records at the Utah Division of State History, Antiquities Division were consulted to identify previously recorded cultural resources that may be adversely affected by the proposed Narrows Project. The *National Register of Historic Places* (NRHP) was also examined. As a result of the 1979 inventory, three cultural resource sites were identified in the reservoir pool area. The sites, however, were not evaluated for NRHP eligibility. Prior to initiation of final design and construction, Class I and Class III cultural resource inventories, as well as consultations with various consulting parties, including Indian tribes, would need to be completed before a determination of effects to cultural resources from the Narrows Project could be made.

Indicators for this issue:

- ◆ Number of historic and cultural sites inundated or otherwise impacted by construction of the reservoir and ancillary facilities
- ◆ Potential tribal concerns regarding traditional cultural properties or sacred sites within the area of potential effects (APE)

Issue No. 10 – What social and economic effects would be expected from the Narrows Project?

Reclamation recognizes that implementing the alternatives may result in impacts on the local residential community in the vicinity of the Narrows damsite. Aside from the environmental issues previously identified above, local communities often are concerned with intangible quality of life impacts that implementing the alternatives may present. Key community concerns frequently include impacts downstream from Scofield Reservoir and the social and economic effects on Carbon and Sanpete Counties.

Indicators for this issue:

- ◆ Number of jobs (Carbon, Sanpete) created during construction
- ◆ Change in farm income
- ◆ Change in available water supply in Sanpete and Carbon Counties

Issue No. 11 – What effect would there be on existing land uses, rights-of-way, and potential mineral leasing?

Since more than half of the shoreline of the proposed reservoir would be on private land, there would be potential for development of the private land including subdivisions, roads, summer homes, lodges, and utilities. Development of this land

could cause problems such as erosion and ground and surface water pollution.

The project would be located within the boundaries of four USDA Forest Service grazing allotments. The reservoir, campgrounds, and additional roads may decrease available forage for livestock and wildlife.

Since the proposed dam and reservoir are in the vicinity of known mineable coal reserves, the project could affect the mineability of Federal and private coal resources.

Indicators for this issue:

- ◆ Percentage of shoreline in private ownership
- ◆ Change in number of animal unit months (AUMs) of forage use
- ◆ Acres of mineable coal reserves not available for mining

Issue No. 12 – What effects on public safety would there be from the Narrows Project?

The finished reservoir would be an attraction to the public, which may increase recreational traffic on SR-31, SR-264, and local USDA Forest Service roads in the vicinity, leading to possible congestion and accidents. Local USDA Forest Service roads may need reconstruction to a higher standard if traffic levels increase appreciably.

Indicator for this issue:

- ◆ Percent expected change in the volume of traffic in the project area

Issue No. 13 – What would be the effects upon air quality associated with constructing the Narrows Project?

The Narrows Project is located in a remote and rugged mountainous terrain. The air

quality associated with this area is generally excellent. Noise in the proposed project area is generally low and not disturbing. The construction activities potentially may affect the air quality of the Narrows basin during construction activities.

Indicator for this issue:

- ◆ Number of days project will exceed National Ambient Air Quality Standards (NAAQS) for particulate matter
- ◆ Noise indicator

Issue 14 – Would the slopes of Fairview Canyon be affected by construction and operation of the Narrows Project? What effects will there be on channel stability from the Narrows Project?

Concern was expressed about the potential impacts from additional flows through Cottonwood Creek to the already unstable Fairview Canyon. Several landslides have been identified in the canyon. Concern was expressed about the adjacent slopes in Cottonwood Creek.

Indicators for this issue:

- ◆ Frequency of exceeding the 50-year channel-forming discharge
- ◆ Lateral and vertical slope degradation

Issue No. 15 – What would the geologic hazards and earthquake hazards be from the Narrows Project?

The dam and reservoir would lie on the North Horn Formation and colluvium. The dam location and design must ensure long-term stability based on geologic conditions, including seismicity of the area, foundation conditions, permeability of the surrounding materials, and land stability.

Indicator for this issue:

- ◆ Number and severity of known geologic hazards within vicinity of dam and reservoir

Issue No. 16 – What would the effect be upon the soils of the area from the Narrows Project?

Concern was expressed about soil erosion in the project area and sediment loads transported in Gooseberry Creek.

Indicators for this issue:

- ◆ Acres of new soil disturbance
- ◆ Change in sediment loads in Gooseberry Creek

Issue No. 17 – What would the effect upon levels of trace elements in the ground water supply be from constructing the Narrows Project?

Concern was expressed about the salt pickup from the dissolution of salts from the soil and subsurface materials. Deep percolation from irrigation dissolves salts from the soils and shales and conveys them to natural drainages.

Indicator for this issue:

- ◆ Increase in levels of select trace elements in ground water

Issue No. 18 – What would the impact of the Narrows Project be on Indian Trust Assets (ITA)?

The United States has an Indian trust responsibility to protect and maintain rights reserved by, or granted to, Indian tribes or Indian individuals by treaties, statutes, and Executive orders, which rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that all Federal agencies, including

Reclamation, take all actions reasonably necessary to protect Indian trust assets.

Indicator for this issue:

- ◆ Number of ITAs affected

Issue No. 19 – What would the impact of the Narrows Project be on Environmental Justice?

According to Executive Order No. 12898, agencies are required to analyze the environmental effects, including human health and economic and social effects of Federal actions and effects on minority communities and low income communities.

Indicator for this issue:

- ◆ Number of low income or minority communities disproportionately affected by the Narrows Project

Issue No. 20 – What climate change issues might affect, or be affected by, the Proposed Action?

Since publication of the draft EIS in 1998, issues associated with climate change have received dramatically increasing national and international attention; and, in recent years, there has been increased research and an increasing database on the topic of how climate change might affect, or be affected by, water supply systems and projects. A recent interagency report, *Climate Change and Water Resources Management: A Federal Perspective* (USGS, 2009), summarizes the issue as follows:

Observational evidence shows that many natural systems are being affected by regional climate changes, particularly temperature increases...Climate change is but one of many dynamic processes impacting water resources management. Other processes (for example, change in population size and location, economic

*development and land use, aging infrastructure, ground-water development, and changing social values) also have major influences on water resources and must be considered along with climate change in a holistic approach to water resources management. Climate change has the potential to affect many sectors in which water resource managers play an active role, including water availability, water quality, flood risk reduction, ecosystems, coastal areas, navigation, hydropower, and other energy sectors. These changes may have adverse or positive impacts on one or more sectors. Any or all of these changes could occur gradually or abruptly.*³

Reclamation has undertaken steps to model the effects of climate change on water delivery systems on a regional basis and for its larger reservoirs, such as Lake Powell and Flaming Gorge Reservoir. To date, however, models have not been developed with sufficient detail or sensitivity to capture small projects such as the proposed Narrows Project, which involves storage and distribution of 5,400 acre-feet of water per year. Historic Utah records indicate that both temperatures and precipitation in Utah (<http://www.ncdc.noaa.gov/oa/climate/research/cag3/ut.html>) have been increasing. However, without verified models addressing climate change at this project level, Reclamation concludes that, at this time, data and modeling tools are not yet developed to the point that meaningful analysis of a small project can be achieved.

³ *Climate Change and Water Resources Management: A Federal Perspective*, Circular 1331, U.S. Geological Survey, Reston, Virginia, 2009. pg. 1.

1.8 PERMITS, AUTHORIZATIONS, AND AGREEMENTS

Implementation of the Proposed Action could require a number of authorizations or permits from State and Federal agencies. These are summarized below.⁴

- ◆ Reclamation approval of the SRPA loan and congressional approval of the necessary funds to construct the Narrows Project
- ◆ Reclamation authorization for SWCD use of withdrawn lands to construct and operate Narrows Dam and Reservoir
- ◆ Utah Division of Water Quality authorization needed for a Storm Water Discharge Permit (Section 402 of the Clean Water Act, as amended)
- ◆ A USACE permit in compliance with Section 404 of the Clean Water Act, as amended, or Utah Department of Natural Resources authorization for a State Stream Alteration Permit (Section 404 of the Clean Water Act, as amended)
- ◆ Utah Division of Water Quality authorization for a Utah Pollution Discharge Elimination Permit (Section 402 of the Clean Water Act, as amended)
- ◆ Reclamation consultation with the State Historic Preservation Office (SHPO)

⁴ Before beginning activities under the Proposed Action, SWCD would consult with both the USACE and Utah Department of Natural Resources to determine which permits would be necessary.

1.9 DOCUMENT ORGANIZATION

This document follows the requirements established in the CEQ regulations (40 Code of Federal Regulations [CFR] 1502.10, and the Interior NEPA regulations, 46 CFR Subpart E). The document consists of the following main chapters:

- ◆ Chapter 1 – Purpose of and Need for the Action
- ◆ Chapter 2 – The Alternatives Considered Including the Proposed Action Alternative
- ◆ Chapter 3 – Affected Environment/Predicted Effects
- ◆ Chapter 4 – Consultation and Coordination
- ◆ Chapter 5 – List of Preparers
- ◆ Chapter 6 – Bibliography, Glossary of Terms, and List of Abbreviations and Acronyms
- ◆ Chapter 7 – Index
- ◆ Appendix A – 1984 Compromise Agreement
- ◆ Appendix B – Evaluation of Potential Damsites in Sanpete Valley
- ◆ Appendix C – Biological Opinion
- ◆ Appendix D – Fish and Wildlife Coordination Act Report
- ◆ Appendix E – Cultural Resource Coordination
- ◆ Appendix F – Environmental Commitments