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Section 6

West Desert Basin

Utah State Water Plan

MANAGEMENT

6.1 INTRODUCTION

This section describes the existing water management systems for irrigation, municipal, industrial and wildlife use. Management organizations are listed and general recommendations are made. Management for water quality, fisheries, conservation and groundwater use are covered in other sections of this report. Water supplies throughout the West Desert Basin are locally managed by cities, towns, and irrigation companies.

6.2 SETTING

As was true in most other areas of the state, water supplies in the early years of settlement were managed by bishops of the Church of Jesus Christ of Latter-day Saints. Later, irrigators organized irrigation companies to manage the water resources. Culinary water systems were established soon after settlement by communities to meet domestic needs. They now operate under guidelines established by federal regulations and state rules administered by the Division of Water Rights and the Division of Drinking Water.

Pruess Reservoir

In 1869 the Southern Pacific Railroad constructed Rosebud Reservoir south of Park Valley. This was the first of twenty-four reservoirs constructed in the basin. Most of the basin's 24 reservoirs are used today to store water for irrigation, but there other uses including wildlife habitat, flood control and tailings storage. See Table 6-1 for a list of the basins reservoirs and Figure 6-1 for the locations.

> Management of the limited water supply's in the basin is necessary to ensure the proper diversion, transmission, treatment, storage and distribution of this valuable resource to the proper users.

6.3 MANAGEMENT ENTITIES AND SYSTEMS

6.3.1 Agricultural Water Management

Incorporated mutual irrigation companies serve the majority of irrigated land in the basin. Irrigation companies serving the West Desert Basin are identified in the Division of Water Right's publication, *Water Companies in Utah*. Only 30 of the companies listed have service areas exceeding 100 acres (Table 6-2). The acres served, as listed in Table 6-2, represent the acreage allowed by the water rights held by the companies and may not represent the actual acres irrigated. The 1994 water-related land-

Table 6-1
EXISTING RESERVOIRS
West Desert Basin

Dam Num.[1]	Name	County	Use	Stream	Owner	Surface Area (acres)	Total Storage (ac.-ft.)
012	Atherley	Tooele	Wildlife Habitat	Faust Creek	Utah Wildlife Resources	52	176
018	Bar B Ranch	Box Elder	Irrigation	Springs	Thiokol Corporation	15	82
044	Blue Creek	Box Elder	Irrigation	Blue Creek	Blue Creek Irr. Co.	135	2,185
083	Death Creek	Box Elder	Irrigation	Death Creek	Boyd Warr	21	228
084	Deep Creek (Tooele)	Tooele	Irrigation	Deep Creek Wash	Kraig Higginson	80	400
089	Dejarnatt	Box Elder	Flood Control	Blue Creek	Blue Creek Irr. Co.	66	385
123	Granite Creek	Juab	Irrigation	Red Cedar Creek	Red Cedar Corp.	76	186
139	Wrathal-Johnson	Tooele	Irrigation	Fishing Creek Springs	Paul Wrathal & Max Johnson	85	227
168	Pruess Lake	Millard	Irrigation	Lake Creek	LDS Church	300	11,803
201	Meadow Creek	Box Elder	Irrigation	Meadow Creek	J.R. Simplot	10	105
261	Rose Ranch	Box Elder	Irrigation	Deep Creek	Rose Ranch	165	300
270	Settlement Canyon	Tooele	Irrigation	Settlement Creek	Settlement Canyon Irr. Co	315	1,168
312	Vernon	Tooele	Irrigation	Vernon Creek	Vernon Irrigation Co.	35	560
319	Etna	Box Elder	Irrigation	West Fork Grouse Ck	WF Grouse Ck Irr. Co.	86	1,471
343	Grantsville	Tooele	Irrigation	S. & N. Willow Creeks	Grantsville Irrigation Co.	88	3,370
369	Warm Springs	Box Elder	Water Supply	Marble Canyon	John J Kunzler Estate	20	90
440	Mormon Gap	Millard	Water Supply	Antelope Valley	U.S. - B.L.M.	15	90
525	Rosebud	Box Elder	Irrigation	Rosebud Springs	Southern Pacific Co.	4	18
532	Sandarosa	Box Elder	Irrigation	Deep Creek	Signa Investment Inc.	175	3,750
538	State Line Creek	Iron	Irrigation	State Line Creek	Mike Flinspach	13	205
577	Grantsville Reg. Pond	Tooele	Regulating Reservoir	S. & N. Willow Creeks	Grantsville Irr. Co.	4	31

1. State Engineer's identification number

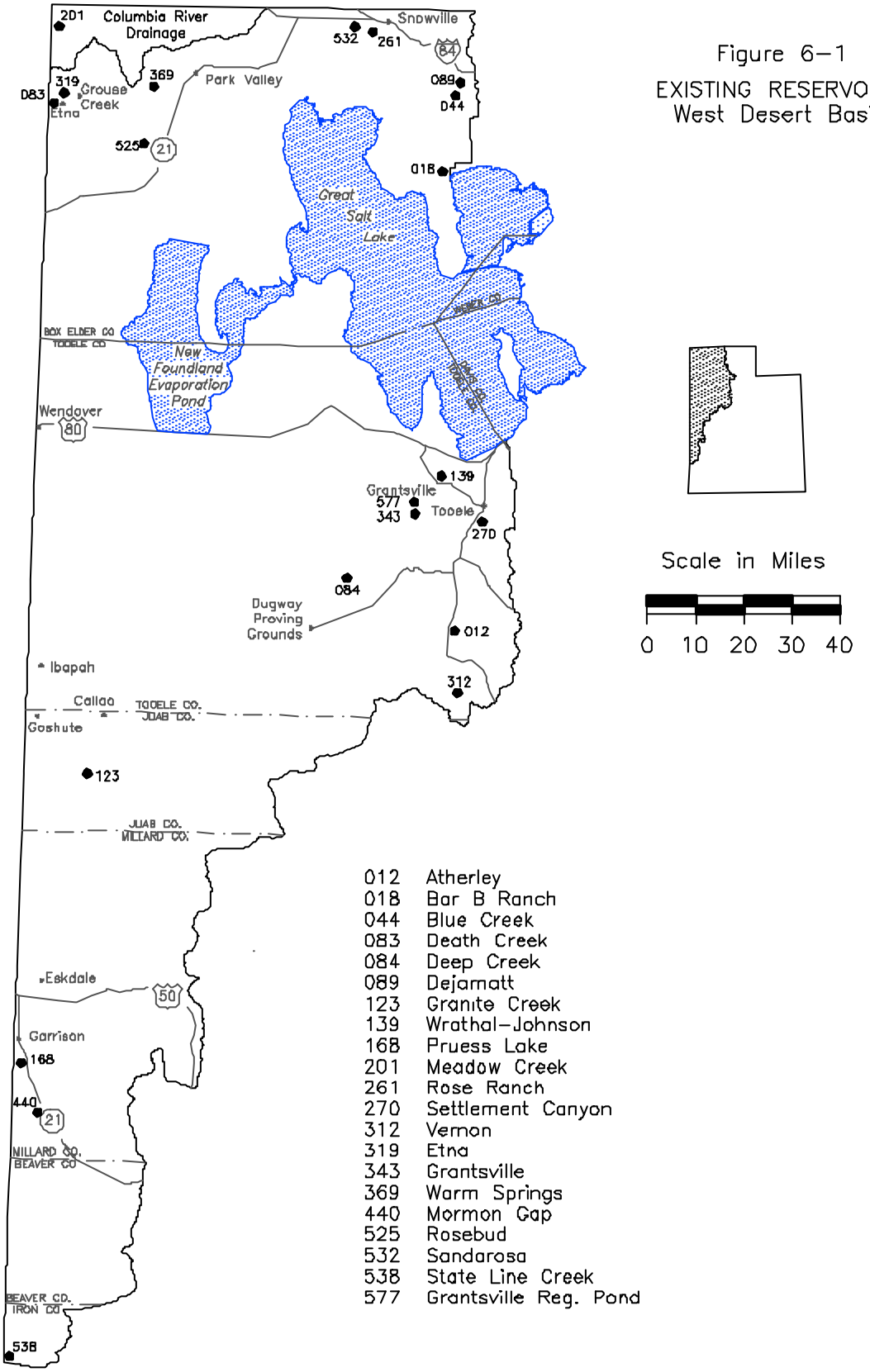

Figure 6–1
EXISTING RESERVOIRS
West Desert Basin

Table 6-2
IRRIGATION COMPANIES

Subbasin/Irrigation Company	Source	County	Irrigated Acres
Columbia River Basin			
George Creek Irrigation Corporation	George Creek & others	Box Elder	2,980
NAF Irrigation Company	Clear Creek	Box Elder	760
Rice and Jim Canyon Irrigation Company	Rice & Jim Canyon Cks	Box Elder	240
South Junction Creek Water Users	South Fork Raft River	Box Elder	890
Park Valley/Grouse Creek			
Curlew Irrigation Company	Grassy Flat Spring	Box Elder	2,600
Death Creek Irrigation Company	Death Creek	Box Elder	100
East Grouse Creek Water Company	Grouse Creek	Box Elder	1,000
Fisher Creek Irrigation Company	Fisher Creek	Box Elder	1,570
Marble Creek Irrigation Company	Marble Creek	Box Elder	3,000
Pine Creek Irrigation Company	Pine Canyon Creek	Box Elder	1,200
Rosen Valley Irrigation Company	Big Hollow Creek	Box Elder	760
Promontory			
Blue Creek Irrigation Company	Blue Creek Springs	Box Elder	1,070
Howell-Blue Creek Irrigation Company	Blue Creek	Box Elder	2,200
Great Salt Lake Desert			
West Deep Creek Irrigation and Power Co	West Deep Creek	Tooele	1,730
Callao Irrigation Company	Basin Creek & others	Juab	1,300
Tooele/Rush Valley			
E.T. Irrigation Canal Company	Mill Pond Spring	Tooele	610
Grantsville Irrigation Company	Davenport & S.Willow Creek	Tooele	4000
Harker Creek Irrigation Company	Harker Creek	Tooele	200
Hickman Creek Irrigation Company	Hickman Creek	Tooele	1000
Middle Canyon Irrigation Company	Middle Canyon	Tooele	510
Ophir Creek Water Company	Ophir Creek	Tooele	1090
Settlement Canyon Irrigation Company	Settlement Canyon Ck	Tooele	580
Soldier Canyon Water Company	Soldier Creek	Tooele	700
St John Irrigation Company	Clover Creek	Tooele	150
Upper Clover Irrigation Company	Clover Creek	Tooele	850
Vernon Irrigation Company	Vernon Creek and others	Tooele	1000

This list only includes companies with water rights to serve lands in excess of 100 acres.

use survey of the basin identified 78,770 acres of irrigated lands. The current agricultural land use trends are discussed in greater detail in Section 10.

6.3.2 Municipal and Industrial Water Systems

If a drinking water system serves at least 15 connections, or 25 people at least 60 days per year, it is generally defined by law as a "public water system." By this definition, there are 17 public water systems in the basin. A list of public water suppliers can be found in Table 11-1. Drinking water issues, including a more detailed analysis of the existing public drinking water systems within the basin are included in Section 11, “Drinking Water.”

Some light industries use water delivered by public water systems. It is estimated about 6 percent of the public water supply is used for industrial purposes. Most of the industrial water use, however, is self-supplied from privately held water rights, primarily wells. The biggest use of water for industrial purposes in the basin is mineral extraction from the Great Salt Lake. Several large companies operate evaporation ponds that extract salt and other valuable minerals from the Great Salt Lake. Subsequent mineral refinement processes frequently require a fresh water supply. See Section 18 for more detailed information on industrial water use.

6.3.3 Great Salt Lake Management

The Great Salt Lake watershed is home to more than 1.5 million inhabitants. With that many people present, toxic pollutants inevitably find their way into the lake. Storm runoff carries with it motor oil, gasoline, anti-freeze and other toxic materials from roads, parking lots, gas stations, home driveways and other locations. Often these non-point source pollutants are a much bigger problem than point sources. Point sources such as wastewater treatment plants are often targeted because they are easy to identify and monitor. Relative to many non-point sources, however, wastewater effluent is relatively free of toxic pollutants and provides the lake with beneficial nutrients. In contrast storm runoff can deliver significant amounts of toxic waste materials to the lake.

The Great Salt Lake provides hundreds of jobs and brings millions of dollars into the Utah economy through the mineral extraction and brine shrimp industries. At the same time, the Great Salt Lake provides a unique environmental habitat for many millions of migratory birds as well as many thousands of resident birds and other wildlife that inhabit the 250,000 acres of wetlands along the lake shoreline. The competing interests of wildlife and industry make management of the lake a complicated issue. On March 1, 2000 the Utah Department of Natural Resources published the Great Salt Lake Comprehensive Management Plan and Decision Document. This document was developed cooperatively with many state agencies and establishes the guidelines for the future management of the Great Salt Lake.

Between 1983 and 1987, the Great Salt Lake, in response to record rainfalls and unseasonable cool and wet springs, rose dramatically to a historic record high elevation of about 4212 feet above sea level. The high water flooded wastewater treatment facilities, power lines, dikes and wetlands at the wildlife refuges, and private duck clubs, as well as dikes and evaporating ponds at many commercial mineral extraction facilities along the lake’s shoreline. The high water also threatened freeways, railway lines, additional wastewater treatment facilities, and power lines, and caused further damage to the already impacted mineral mining companies and wildlife facilities around the lake.

In an effort to reduce the flooding around the lake, the state breached the railroad causeway on August 1, 1984. It had been determined that breaching the causeway would lower the south part of the lake at least one foot. By this time, the lake was so high that breaching was viewed as an interim measure until a more permanent solution could be found. Between 1984 and

1986 many alternatives were investigated in order to determine the best way to address the continued rise of the Great Salt Lake. In May, the Second Special Session of the 1986 Utah State Legislature authorized $60 million for the Utah Division of Water Resources to construct the West Desert Pumping Project. The pumps were built on the western shore of the lake at Hogup, delivering water to the diked New Foundland Evaporation Pond in the west desert, covering 320,000 acres. Great Salt Lake water was pumped into the west desert from May of 1987 through June of 1989. During that period of time the project lowered the lake approximately 26 inches. Today the pumps remain in place as insurance to reduce the impact of flooding should the Great Salt Lake again rise to elevations similar to those of the mid '80s.

West Desert Pump Station

The Utah Department of Natural Resources (DNR) and the Utah Division of Forestry, Fire and State Lands (DFFSL) are currently sponsoring the Great Salt Lake Planning Project to develop a coordinated natural resources management plan for the lands and resources of the Great Salt Lake. Primary management responsibility of the lake's resources lies with DFFSL pursuant to Title 65L of the Utah Code, which governs management of all state lands. Specifically, Section 65A-10-8, "Great Salt Lake - Management Responsibilities of the Division," require the division to:

"Prepare and maintain a comprehensive plan for the lake which recognizes the following policies: (a) develop strategies to deal with a fluctuating lake level; (b) encourage development of the lake in a manner which will preserve the lake, and protect recreation facilities; (c) maintain the lake's flood plain as a hazard zone; (d) promote water quality management for the lake and its tributary systems; (e) promote the development of lake brines, minerals, chemicals, and petro-chemicals to aid the state's economy; (f) encourage the use of appropriate areas for the extraction of brines, minerals, chemicals, petro-chemicals; (g) maintain the lake and the marches as important to the waterfowl flyway system; (h) encourage the development of an integrated industrial complex; (I) promote and maintain recreation areas on and surrounding the lake; (j) encourage safe boating use of the lake; (k) maintain and protect state, federal, and private marshlands, rookeries, and wildlife refuges; (l) provide public access to the lake for recreation, hunting and fishing."

The goal of the plan is to provide needed information and guidance in the form of recommendations to federal, state and local governments, and recommend legislation to the state legislature to facilitate and enhance management of the Great Salt Lake and its environs to assure protection of the unique ecosystem of the lake while promoting balanced multiple-resource uses. The objectives of the Great Salt Lake Planning Project are:

(1) To establish unifying DNR management objectives and policies for GSL trust resources,

(2) To coordinate the management, planning and research activities of DNR divisions on GSL,

(3) To coordinate management with the actions of land and resources owners and managers on and adjacent to the Great Salt Lake;

(4) To develop a sovereign lands and resources management plan, and

(5) To establish processes for plan

implementation, monitoring, evaluation and amendment.

6.3.4 Wetlands Management

Nearly half of the basin's mapped wetlands (17,992 acres) are located in the Fish Springs National Wildlife Refuge in Dugway, Utah. This valuable wildlife resource is managed by the U.S. Fish and Wildlife Service. It is a true oasis for wildlife in the midst of the Great Salt Lake Desert, providing a lush habitat for migrating and native species of birds. It is also home to many native mammals common to the Great Basin. There are an estimated 250,000 acres of wetlands along the southern and eastern shores of the Great Salt Lake. These wetlands are discussed in the Jordan River, Weber River and Bear River basin plans.

6.3.5 Watershed Management

The best way to reduce accelerated erosion is to establish a healthy watershed. If there is a variety of grasses and forbes along with brush in the lower elevations and a mixture of conifers and aspen along with grasses in the higher elevations, erosion will be drastically reduced. This will require an intensive rehabilitation program along with intensive management of livestock and wildlife grazing. With reduced erosion, there will be less sedimentation.

Along this same line, recent studies have indicated increases in runoff can be achieved if upper watershed vegetation can be managed. However, this will require more research. Studies to date indicate water yield can be increased if aspen dominated stands exist rather than mixed conifer with some aspen. For every 1,000 acres of forest lands converted from conifer to aspen, annual water gain of 250-500 acre-feet. In addition, there is a potential gain of 500 to 1,000 pounds of undergrowth, most of which is forage. This could lead to a gain in numbers and kinds of plants and animals.

Not only does this increase the downstream water supply and forage for livestock and wildlife, it also provides sites for recreational opportunities, wood fiber, landscape diversity and aesthetics. The loss of these benefits has come from the successional process, reduction of wildfire which has allowed dense conifer stands, and long-term overuse by cattle and wildlife. There are several, although often controversial, alternatives to reduce replacement of aspen stands by conifers, sagebrush or tall shrubs. These include fire, harvesting, spraying ripping and chaining.

6.4 MANAGEMENT PROBLEMS AND NEEDS

A problem throughout the basin is the lack of late season irrigation water. Throughout the basin surface water sources have been close to fully developed as agricultural water supplies. Most of the basins streams though are intermittent and convey little or no flow in the late summer and early fall. Agricultural communities that have developed secondary groundwater sources have a decided advantage over communities that have not.

6.5 ALTERNATIVES FOR MANAGEMENT IMPROVEMENTS

Providing for late season irrigation needs can be accomplished either by constructing reservoirs to capture spring runoff that exceeds the irrigation demand, or by additional groundwater development. The development of supplemental groundwater seems to be the most likely option since reservoir construction is very expensive when compared with the yield available for most West Desert Basin streams.