SALT LAKE COUNTY DEMAND AND SUPPLY STUDY

Prepared for:

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CHAPTER 3
ANNUAL SUPPLY EVALUATION – INDIVIDUAL WATER PROVIDERS

With demand projected for each of the major water providers in the County, it is next necessary to evaluate the existing and future water supplies of each entity relative to its projected demand. This chapter examines the water supplies on an annual basis for each of the major water providers in the County individually. The following chapter considers the County as a whole.

In evaluating supply, yields have been estimated for each source for both "average year" and "dry year" conditions. Water supplies delivered in Salt Lake County are highly dependent on precipitation in the Wasatch and Uinta Mountains. Because precipitation varies considerably from year to year, public water suppliers must construct systems that will reliably deliver necessary supplies through periods of below normal precipitation. Water suppliers also must consider the risk of multiple years of below normal precipitation with allocating supplies between current demands and next season's demands. The term "dry year yield" is often used by water suppliers to define an amount of which a specific source will reliably supply, even following multiple years of below normal precipitation. For the purposes of this study, the dry year yield of each source is equal to the lowest yield on record for that source for which records are available, or is an estimate reliable yield if historical records are unavailable.

METROPOLITAN WATER DISTRICT OF SALT LAKE & SANDY – EXISTING AND FUTURE SOURCES

MWDSLS is a water wholesaler for Salt Lake and Sandy City. As such, supplies for the MWDSLS service area include independent sources for the individual cities as well as the wholesale sources of MWDSLS. This section describes existing and future sources of supply for both the individual member cities and for MWDSLS as a whole.

Salt Lake City – Existing Sources

Salt Lake City's existing water supply comes from a number of different sources. For planning purposes, SLC's sources have been grouped into the following categories:

- Surface Water Sources
- Ground Water Sources
- Preferred Rights in MWDSLS.

The yields of each of these sources are discussed in the following sections.

Salt Lake City Surface Water Sources – SLC owns or controls water rights in several surface water sources. This includes surface water treated at the following City owned and operated treatment plants: Big Cottonwood Water Treatment Plant (BCWTP), Parleys Water Treatment Plant (Parleys WTP), and City Creek Water Treatment Plant (CCWTP). This category also includes surface water in Little Cottonwood Creek. This water is treated at Little Cottonwood Water Treatment Plant (LCWTP), a plant owned and operated by MWDSLS. However, the underlying water rights in the creek are owned and controlled by SLC. BC&A has evaluated the estimated future production from each of these sources based on historic flow records for each surface water source, available storage, and available treatment capacity for each of the plants:

Table 3-1
Projected Annual Yield of Salt Lake City Surface Water Sources

Source	Average Year Yield (acre-feet)	Dry Year Yield (acre-feet)	Comments
BCWTP	26,050	18,182	Dry year based on 1934 flow records; little available storage. Does not include 1,099 acre-feet exchanged to Holliday Water Co.
Parleys WTP*	7,940	3,100	Dry year based on firm yield of Little Dell Reservoir
CCWTP	8,270	4,420	Dry year based on 1961 flow records; no available storage
LCC (LCWTP)	24,357	16,320	Dry year based on 1992 flow records; no available storage. Includes any Sandy City Little Cottonwood water above Sandy City demands.
Total	**66,617**	**42,022**	

*The underlying rights in Little Dell Reservoir are actually owned by MWDSLS. These rights are included here because they are treated at a facility owned and operated by SLC and are exclusively used by SLC.

It should be emphasized that these values are based on projected future demands. Currently, the useable production of some sources (especially Little Cottonwood Creek) is less than reported here because the water is available during peak spring runoff in excess of system demands. Thus, the current yields of these sources will be slightly less than the report yields above.

Salt Lake City Groundwater Sources – SLC owns water rights for a number of groundwater sources. For evaluation purposes, these sources have been broken into two categories:

- Base Wells and Springs – SLC has a number of springs and artesian wells that require little or no pumping. Water from these sources is used year round by the City. The estimated average production of these sources is 7,353 acre-feet. This is for both average and dry water years.

- Peaking Wells – All remaining groundwater sources owned by the City are generally used only during the summer months to meet peak demands. Annual production from these wells will vary significantly based on needs. In average years, the estimated yield of these wells is 4,547 acre-feet. The estimated maximum of the wells in dry years is 10,547 acre-feet.

Combining both categories of groundwater sources results in an average year yield of 11,900 acre-feet and a maximum dry year yield of 17,900 acre-feet/year.

Salt Lake City Preferred Rights in MWDSLS – This category of supply consists of water received by the City through its membership in MWDSLS. This includes both Provo River Project Water (stored in Deer Creek Reservoir) and Central Utah Project (CUP) Bonneville Unit M&I Water (stored in Jordanelle Reservoir). Prior to 2005, the average year production of these sources was 53,760 acre-feet. This is based on the full MWDSLS Provo River Project allotment of 61,700 acre-feet less 7,940 acre-feet of preferred storage to Sandy City. Dry year production

of these sources was 22,910 acre-feet. This is based on a 50 percent allotment from Deer Creek Reservoir as was experienced during the recent drought (2002). With the completion and filling of Jordanelle Reservoir, the City's projected production in both dry and average years will increase by 20,000 acre-feet.

Salt Lake City – Future Sources

Salt Lake City is currently considering several potential new sources:

- New Well Development
- Additional Surface Water Development
- Wastewater Reuse
- Utah Lake System (ULS) Water.

New Well Development – To meet future demands, SLC has planned for the development of additional wells at various locations throughout its system. The City estimates development of current City rights could yield up to 12,000 acre-feet of additional ground water in dry years. In average years, it has been assumed that yields would be limited to 3,000 acre-feet. For the purposes of this report, it has been assumed that groundwater development would begin with 3,000 acre-feet in 2010, with an average of 1,500 additional acre-feet being developed each subsequent year through 2016.

Additional Surface Water Development – Another potential new supply SLC is exploring is development of additional surface water sources. This could include construction of a treatment plant to treat water from Millcreek Canyon or from other surface water sources. The City would like to develop additional surface water sufficient to produce at least 3,300 acre-feet during dry years. Based on historic flow records for Millcreek, this equates to an estimated average year yield of 3,967 acre-feet. For this analysis, it has been assumed that this source will develop around 2013.

One other potential future source of surface water for SLC is from the Ontario Drain Tunnel. SLC has limited rights to water from the Ontario Drain Tunnel that could be treated and delivered to SLC through MWDSLS. However, SLC does not have any current plans to use this source and it is currently being leased to Jordanelle Special Service District (JSSD). As a result, no additional yield from this source has not been included as part of the SLC supply plan.

Wastewater Reuse – SLC is actively pursuing opportunities for wastewater reuse. Probable reuse opportunities currently being studied include irrigation of two large golf courses and a park area near the City's wastewater treatment plant. Initial City plans for wastewater reuse would produce approximately 5,000 acre-feet annually and would begin deliveries in 2015. Production would be constant in both dry and average water years.

Utah Lake System Water – On behalf of SLC and Sandy, MWDSLS has petitioned Central Utah Water Conservancy District (CUWCD) for CUP water through the planned ULS. Once completed, this system will bring water from Spanish Fork Canyon to the Provo Reservoir Canal (PRC) in Orem. The PRC can then be used to convey the water to the new Point of the Mountain Water Treatment Plant (POMWTP) or JVWTP for treatment. The volume of water MWDSLS has petitioned for is 8,600 acre-feet. The distribution of this source will depend on

the needs of both SLC and Sandy. For planning purposes, it has been assumed that 4,750 acre-feet will be delivered to SLC. Deliveries of this water will begin with the completion of the ULS project, tentatively scheduled to occur around 2021.

The yield of ULS water may be offset by a loss of water associated with enclosure of the PRC. Under a current proposal, CUWCD would pay for a portion of the PRC enclosure costs in exchange for the saved water that is normally lost to seepage and evaporation. Since discussions are still ongoing, it is unknown how much water will be returned to CUWCD and how this loss will be split among users of the canal. For discussion purposes, figures in this report show a potential loss of 1,600 acre-feet for all ULS water petitioned by MWDSLS.

Total Salt Lake Supply

The projected production of each category of supply described above is summarized in Tables 3-2 and 3-3.

Table 3-2
Projected Dry Year Production – Salt Lake City
Existing and Future Sources

Supply Category	Projected Dry Year Production – 2010 (acre-feet)	Projected Dry Year Production – 2100 (acre-feet)
SLC Surface Water Sources	41,600	42,022
Base Wells and Springs	7,353	7,353
Peaking Wells	10,547	10,547
SLC Preferred Rights in MWDSLS	42,910	42,910
New Wells	0	12,000
Additional Surface Water Development	0	3,300
Wastewater Reuse	0	5,000
Utah Lake System Water	0	4,750*
Total	**102,410**	**127,882**

* Does not include any losses as part of PRC Enclosure.

Table 3-3
Projected Average Year Production – Salt Lake City
Existing and Future Sources

Supply Category	Projected Average Year Production – 2010 (acre-feet)	Projected Average Year Production – 2100 (acre-feet)
SLC Surface Water Sources	65,512	66,617
Base Wells and Springs	7,353	7,353
Peaking Wells	4,547	4,547
SLC Preferred Rights in MWDSLS	73,760	73,760
New Wells	0	3,000
Additional Surface Water Development	0	3,967
Wastewater Reuse	0	5,000
Utah Lake System Water	0	4,750*
Total	**151,172**	**168,994**

* Does not include any losses as part of PRC Enclosure.

Sandy City – Existing Sources

Sandy City's existing water supply comes from a number of different sources. For planning purposes, Sandy's sources have been grouped into the following categories:

- Surface Water Sources
- Ground Water Sources
- Storage in MWDSLS
- Jordan Valley Water Conservancy District
- Ontario Drain Tunnel.

The yields of each of these sources are discussed in the following sections.

Sandy City Surface Water Sources – Sandy City owns water rights in Little Cottonwood Creek and Bell Canyon Creek. Sandy City recently completed an aqueduct between the two canyons to allow Bell Canyon Water to be treated at the LCWTP. With the addition of this water, the projected yield of Sandy City surface water rights is 14,938 acre-feet in average years (980 acre-feet from Bell Canyon) and 8,683 acre-feet in dry years (863 acre-feet from Bell Canyon). Dry year yields are based on 1992 historic flows in the creeks. Average year yields are based on average daily historic flow from 1960 to 1992. It should be emphasized that these values are based on projected future demands. The current useable production of some sources is less than reported here because some of the available water during spring runoff is in excess of system demands. It should be noted that yields reported here include some change applications that have not yet been approved. If any pending change applications are not approved, there will be a corresponding decrease in annual yield.

Sandy City Ground Water Sources – Sandy City owns water rights for a number of ground water sources. With the completion of several new wells, the projected maximum production of Sandy City wells will be approximately 20,000 acre-feet. Unfortunately, many of these water

rights are junior water rights that may be affected by restrictions imposed by the State Engineer through the Salt Lake Valley Ground Water Management Plan. For planning purposes, it has been assumed that Sandy City may lose its most vulnerable water rights, those with a priority date of 1976 or later. If this occurs, the maximum annual yield of Sandy City ground water will be reduced to 14,400 acre-feet. To facilitate full use of these rights in drought years, Sandy City has historically reduced ground water withdrawals as much as possible in average years. For the purposes of this report, it has been assumed that ground water withdrawal in average years will be only 6,000 acre-feet.

Sandy City Storage in Metropolitan Water District of Salt Lake & Sandy – This category of supply consists of storage water received by Sandy City through its membership in MWDSLS. Sandy City receives a preferential right to 7,940 acre-feet from MWDSLS in all years. In addition, Sandy City can use any storage water not used by SLC. In dry years, no storage water from SLC is projected. In average years, however, SLC storage available to Sandy City may be as much as 31,788 acre-feet.

Jordan Valley Water Conservancy District – Sandy City has a contract for 315 acre-feet of water from JVWCD. This water can be taken in both dry and average water years. It is assumed that the City will eventually cancel this contract and no longer use any water from JVWCD.

Ontario Drain Tunnel – On behalf of Sandy City, MWDSLS has recently acquired a number of surface water rights associated with the Ontario Drain Tunnel. The estimated yield of these rights is 2,664 acre-feet in dry years and 3,267 acre-feet in average years.

Sandy City – Future Sources

Sandy City is currently considering one new source of water:

Utah Lake System Water – On behalf of SLC and Sandy, MWDSLS has petitioned CUWCD for CUP water through the planned ULS. Once completed, this system will bring water from Spanish Fork Canyon to the PRC in Orem. The PRC can then be used to convey the water to the new POMWTP for treatment. The volume of water MWDSLS has petitioned for is 8,600 acre-feet. The distribution of this source will depend on the needs of both SLC and Sandy. For planning purposes, it has been assumed that 3,850 acre-feet will be delivered to Sandy. Deliveries of this water will begin with the completion of the ULS project, tentatively scheduled to occur around 2021. As with Salt Lake City, a portion of this water may be returned to CUWCD as part of the enclosure project.

Total Sandy Supply

The projected production of each category of supply described above is summarized in Tables 3-4 and 3-5.