INSERT DATE HERE
WATER CONSERVATION AND DROUGHT MANAGEMENT ADVISORY BOARD
REGULAR MEETING 2:00 P.M.

City Council Chambers
217 East Center Street
Moab, Utah 84532

1. Call To Order

2. Citizens To Be Heard

3. Old Business

3.I. Moab Water Facts Sheet Review
Discussion (Rosemarie, Chuck and Mike)

Documents:

MOABWATERFACTS.CHUCK.DUNCAN.10-07-2019.PDF
CHUCKS COMMENTS.10-07-2019.PDF

3.I.i. Update On Public Outreach
Discussion (Jeremy and Kara)

3.I.ii. Manti La Sal Forest Plan Draft
Discussion (Group)

3.I.ii.1. USGS Report And Findings
Discussion and Possible Action (Arne)

3.I.ii.2. VCAP
Discussion (Arne and Rosemarie)

Documents:

VCAPPUBLICSUMMARY.PDF

4. New Business

4.I. Local Water Conservation Goal Program
Discussion and Possible Action/Recommendation

4.I.i. Watershed Coordination Council Draft Legislation
Discussion

5. Board Member Terms
Discussion and Possible Action

Documents:

WATER BOARD MEMBER TERMS.PDF

5.I. What Members Have Terms Expiring December 31, 2019

5.II. People In The Community Who Have Expressed A Desire To Serve For Consideration

5.III. Timeline-When To Submit Board Recommendations To Mayor

6. Other Business

7. Adjournment

Special Accommodations:
In compliance with the Americans with Disabilities Act, individuals needing special accommodations during this meeting should notify the Recorder's Office at 217 East Center Street, Moab, Utah 84532; or phone (435) 259-5121 at least three (3) working days prior to the meeting.
Check our website for updates at: www.moabcity.org

MoabWaterFacts.Chuck.Duncan.docx; 15 Sept 2019 draft

Duncan's comments to Chuck's comments
Duncan's text suggestions to address Chuck's Comments to Moab Water Facts sheet.

Additionally, update GWSSA to latest figures:
Footnote 3 reads *GWSSA Water Conservation Plan 2014*,
Should read GWSSA Culinary Water System Master Plan 2016

GWSSA row, Estimates of groundwater use column:
Reads *830 AF*[3],
should read 937 AF[3] ;
see report pg 4, 2092 ERC x 400 (gal/day)/ERC x 365 day/yr / 326 Kgal/AF = 937 AF/yr

GWSSA row, Estimated of potential groundwater production column:
Reads *GWSSA: 3940 AF*[3] *(reported as 9,440 although only 3940 AF of water rights exists)* ,
Table 3.1.1 of the report, pg 6, shows 1672 AF as of writing, but state engineer will permit an additional 2896 – 965 = 1931 AF, subject to monitoring data. Assuming this is successful, this would grant GWSSA a total of 1672 + 1931 = 3606 AF.
Entry should read 1672 AF[3] to reflect "perfected rights."

GWSSA row, Estimated projected groundwater requirements column:
Reads *GWSSA by 2060: 1550 AF*[3],
should read GWSSA by 2035: 1392 AF[3]
see report pg 5, 2% growth in 20 years from 2092 ERCs = 3109 ERCs;
3109 ERC x 400 (gal/day)/ERC x 365 day/yr / 326 Kgal/AF = 1392 AF/yr

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Additionally, update MIC to latest figures:
Change footnote 4 to read Moab Irrigation Co. 2018 Water Distribution Plan
Row labeled *Moab Lower Diversions*, reads *1783 AF*[4],
to be changed below to ½ that value 1714/2 = 857 AF[4].
See moabirrigation.org/WaterDistribution/D1+D2+D3

Generic groundwater vs surface water issue in the chart:

I know from detailed USGS gauge measurements/analysis (that I can present) above Sheley, including base flow months, Mill Creek annual flow is **roughly ½ base flow**. As reiterated in the Facts Sheet, base flow is infiltrated groundwater lost to gaining Mill Creek surface water. So

both Ken's Lake and MIC diversions from Mill Creek are both ground and surface water. [To complicate matters, Mill Creek also loses surface water, along some lower stretches, to groundwater that sources city wells and springs.] The remainder of Mill Creek annual flow is runoff from precipitation and snowmelt.

As seen from the column headings, the chart (and the discussion below it) is intended to track groundwater. Despite confusion as to if "springs" and "surface" water are "groundwater," I suggest we **leave the column headings as shown, i.e. groundwater**. That way we won't be mixing apples and oranges:

In row labeled Ken's Lake Diversion, cols 2-4 read *3100 AF*[1],
should read ½ of that, or 3100/2 = 1550 AF[1] .

In row labeled MIC Lower Diversions, cols 2-4 read *1783 AF*[4],
should read ½ of 1714 AF = 857 AF[4] .

Chuck's comments:

1. City of Moab not Moab City

2. Throughout the document does Acre Feet really mean Acre-Feet per Year? If so we should say so for accuracy and consistency. If not then it should be called out correctly

Underneath the line *Estimated Current and Future Water Use for Moab and Spanish Valley*, place the line Annual flows below are Acre-Feet per Year but shown simply as AF.

3. For Year ending 2018 ambiguous, assume calendar year 2018: 1,819 AF/Yr . Reference footnote No. 1 instead of No. 2
Entry should read 1,819 AF in 2018 [1].

4. not groundwater...UDWR categorizes springs as surface water...therefore call this water use not "groundwater"use. Also Ken's Lake Diversion is not groundwater when diverted
Disagree. Spring water *is* groundwater by all other definitions and by USGS and Kolm studies. Also, see discussion above noting that Mill Creek surface flow is roughly ½ base flow.

5. Add units AF

6. how does it relate to GWSSA water rights? The 5401 comes from the Moab Plan and the 9444 comes from thge GWSSA Plan. If we use the Moab number we should use the GWSSA

number not arbitrarily lower it to a water rights number. GWSSA can obtain water rights in the future if needed the same way Moab can.
Not sure where the 9444 figure originates. The new suggested figure from the GWSSA Culinary Water System Master Plan 2016 is current perfected water rights, assuming successful results of monitoring tests as discussed above.

7. These are water requirements for the system. It does not have to be groundwater.
Practically speaking, I disagree. The only non-groundwater rights are some county rights to Colo. River and MIC rights to Mill Creek flows, the latter of which as explained above are a mix of ground and surface origin. County use of river water is possible but due to expense highly unlikely anytime soon.

Leave as written.

8. What does build out mean here? Per City Adopted Water Distribution Plan Year 2060: 3,801 AF/YR (add reference for footnote No. 5 instead of No. 2)

Add footnote 5. Moab City Water Distribution Plan in year 2060
Use 3801 AF[5]

9. This number is reported to be the amount of water rights that the City has. That number has nothing to do with groundwater requirements or build out. Chuck is correct. The requirement based on projected demand is 3,801 AF/YR as calculated in the Water distribution Plan.

Change value to 3,801 AF

10. Use AF/YR units Append AF

11. should be 11,834 AF/YR

In bottom row, right column, change *Estimated Total Water Requirements* to read "Estimated Total Groundwater Requirements"

These totals should result:

City	1819	5401	3801
GWSSA	937	1672	1392
SJSVSSD	0	500	500
Pvt wells	400	400	400
Pvt irrig well/springs	700	700	700
Kens lake	1550	1550	1550
MIC	857	857	857

totals	6263	11080	9200

12. Add footnote No. 5 City of Moab adopted Water Distribution Plan
See correction #8

13. 9,606 AF/YR with superscript 1
My own (hopefully thorough) addition of DWR rights yields 9658 AF. Numbers may vary somewhat – Skakel Springs is complicated, among other things. But I'll accept Chuck's value – close to mine.

Use 9606 AF[1]

14. Delete Should read as "Perfected Water Rights"

15. Not sure what this means. Delete the "or Groundwater" terms
Disagree. As discussed above, Mill Creek flows are roughly ½ base or groundwater flows, the remainder precip or snowmelt runoff. However, DWR assigns the entire flow as "surface." If we accept the approximation of (roughly) ½ base flow, then use 3100/2 = 1550 for Sheley base flow, and 1714/2 = 857 for MIC diversions base flow.

Surface Water Rights that are "base flow" or groundwater should read
Surface Water Rights that include "base flow" or groundwater
GCWCD & MIC @ Sheley tunnel 1550 AF
MIC Lower Diversions 857 AF

16. Delete Should read as "Perfected Water Rights"

This table is a summary:

	DWR groundwater rights	**Base flow**
City	9606	
GWSSA	1672	
SJSVSSD	500	
Private wells	400	
Private irrig wells & springs	700	
Ken's Lake		1550
MIC diversions		857
totals	12878	2407

Currently reads:
Total Amount of Groundwater currently considered appropriated

Paper water rights (15,631) + base flow rights (4,883) = 20,514 AF
Should read
Total Amount of Groundwater currently considered perfected
DWR groundwater rights (12.878) + base flow rights (2407) = 15285 AF

17. Use only this number. Don't show the addition as the descriptors are not correct.
Diagaree, Fixed per step 16 above

18. Incorrect dimensions. 1 CFS = 235,900,000 gallons/year

19. Incorrect dimensions. 1 CFS = 724 AF/YR

20. This should be AF/YR Append /Year

21. The source of these should be identified. Agree, update

22. of sewage inflow
Old sewer plant sewage inflow 1 Mgals/day
New sewer plant inflow capacity can't read, check MGD

23. to process sewage
Old plant used 2 Mgal/mo water to process sewage

24. to process sewage
New plant uses 25 Kgal/mo water to process sewage

Update Surface or Groundwater discussion (minor edits)

Chucks Comments

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5. Add units
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10. Use AF/YR units
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Vulnerability, Consequences, and Adaptation Planning (VCAP) Scenarios Synopsis

Background

Two aquifers in Spanish Valley (water below surface)

City of Moab - Glen Canyon Aquifer
Domestic water (culinary) comes primarily from springs and secondarily is pumped from wells. The water is from snow pack in La Sal  referred to as snow water equivalents (SWE).

Grand County- Grand Water Sewer Special District (GWSSD) Mill Creek surface water than pumped from wells. GWSSA primarily uses surface water diverted to Ken's Lake from Mill Creek to provide irrigation water and groundwater to provide drinking water to its customers. During times of drought when Ken's Lake has insufficient water, groundwater resources can be stressed due to increased pumping to provide irrigation water.

Restrictions: GWSSD must maintain 3 CFS in Mill Creek for riparian protection ?????

Observed Temperatures and Snowpack/Streamflow

Three of the fifth-hottest years since 1895 has occurred since 2000.

Two of the fifth driest years since 1895 have occurred since 2000.

Moab temperature has risen by 1.9 degrees F since 2000 compared to 20th century average.

El Niño results > Precipitation in Spanish Valley

Snow Water Equivalent (SWE) - climate change affects the timing of runoff. Recent data shows runoff starting shows 9 days earlier.

Adaptation Conditions/Strategies

Droughts affect Spanish Valley in two major ways:
- Less precipitation (rain)
- More surface water evaporates

Carbon dioxide levels are the highest recorded in at least one million years.

Warmer future climate will:

- Create mild drought conditions even during years of average precipitation by increasing evaporation transpiration (ET)
- Warmer temperatures = > amounts of water in a short period. Frequency and intensity storms will increase.
- Increase in # and severity of wildfires.
- Charred soil less likely to absorb water - less infiltration = > flooding

WATER CONSERVATION AND DROUGHT MANAGEMENT

DUTIES & RESPONSIBILITIES

The Moab Water Conservation and Drought Management Advisory Board advises the Moab City Council on policies and practices to ensure a quality water supply for current and future residents of Moab.

MEMBERS

The Water Conservation and Drought Management Board is a seven-member board appointed by the mayor and confirmed by the Moab City Council. Members serve two-year terms.

- Kara Dohrenwend, Chair
  Term expires December 31, 2019
- Jeremy Lynch, Vice Chair
  Term expires December 31, 2021
- Arne Hultquist
  Term expires December 31, 2019
- Mike Duncan
  Term expires December 31, 2021
- Kyle Bailey
  Term expires December 31, 2021
- John Gould
  Term expires December 31, 2020
- Denver Perkins
  Term expires December 31, 2020