AGENDA
IDAHO WATER RESOURCE BOARD

Work Session on the Mountain Home Airforce Base Sustainable Water Project
September 14, 2017
9:00 a.m.

Hampton Inn
Cottonwood A Meeting Room
3175 Foothills Ave.
MOUNTAIN HOME, ID

1. Roll Call
2. Background on Mountain Home Aquifer
3. Establishment of Water District 161 & Measurement Order
4. Water Users from the Aquifer & Economic Importance
5. History of MHAFB Sustainable Water Project
6. Status of MHAFB Sustainable Water Project
7. Comments from U.S. Air Force
8. Comments from Elected Officials/Other Dignitaries

* The Board will break for lunch at approximately 11:45 a.m.

1:00 p.m. – 3:00 p.m.: The Board will depart for a Field Trip to the MHAFB Sustainable Water Project

Transportation will be provided for Board members, IDWR staff, and invited guests due to limited seating.

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email nikki.regent@idwr.idaho.gov or by phone at (208) 287-4800.
Hydrogeology of the Mountain Home Plateau

Presented by Craig Tesch, P.G.
September 14, 2017
Overview

• Hydrogeology
• Administrative Management Areas
• IDWR Groundwater Monitoring Network
• Groundwater Level Declines
• Water Budget
Regional Aquifer

- Part of the larger Western Snake Plain Aquifer
- Primarily in basalts and sediments of the Bruneau Formation
- Depth to water >300 ft
- Recharge
  - Precipitation (9-11 in.)
  - perched aquifer leakage
  - stream infiltration
- Discharge primarily through
  - irrigation consumptive use
  - springs & underflow
- Used for municipal and large scale irrigation
Perched Aquifer

- Shallow, perched system, composed of sediments
- Flanks of the foothills and around the city of Mountain Home
- Depth to water 10 to 200 ft
- Used for domestic and small irrigation purposes
- Extent of connection to the regional system is relatively unknown
Bruneau Formation
Basalt and Sediments

Glens Ferry Formation
Sediments

Idaho Batholith

Groundwater Flow

General Water Table
Administrative Management Areas

- Cinder Cone Butte Critical Ground Water Area (CGWA)
  - Established May 7, 1981
  - Area does not have sufficient ground water to provide a safe supply for current or projected uses
  - No new appropriations

- Mountain Home Ground Water Management Area (GWMA)
  - Established November 9, 1982
  - Area approaching a CGWA
  - New appropriations may be allowed if shown not to injure existing rights
Administrative Management Areas

- Reasons for Designation
  - Rapid agricultural development
  - Water level declines
  - Pending applications for additional development
GROUND WATER USE IN THE MOUNTAIN HOME GWMA

CUMULATIVE CFS BASED ON WATER RIGHT PRIORITY DATE

YEAR OF PRIORITY

CUBIC FEET PER SECOND (cfs)

TOTAL: 471 cfs

TOTAL: 81 cfs

LEGEND
- IRRIGATION
- OTHER USES

1982

01/01/00  01/01/10  06/06/20  01/01/40  01/01/00  01/01/40  01/01/50  01/01/60  02/02/01  12/02/80  05/19/90  04/25/00
IDWR Groundwater Monitoring Network

- 26 wells measured semi-annually
- Primarily irrigation wells in the regional system (250-450 ft)
- Some domestic wells in the perched system (< 100 ft)
- Transducers in two wells near Canyon Creek
Stable or rising water levels (+0.2 ft/year to -0.7 ft/yr)
Declining water levels (-0.1 ft/year to -3.7 ft/yr)
Stable water levels
(+0.15 ft/year to -0.4 ft/yr)
Declining water levels
(-0.2 ft/year to -1.6 ft/yr)
Water Budget

• Harrington (2004)
  ▪ MH GWMA extended to the TVHP boundary
  ▪ -30,900 AF/yr deficit
Water Budget

  - MH GWMA extended to the TVHP boundary
  - -30,900 AF/yr deficit

- Tesch (2012)
  - Cinder Cone CGWA
  - -9,399 AF/yr deficit
**Discharge:** Well pumping, ET, and loss to Snake River
74,000 AF

**Recharge:** Precipitation and surface water flow
43,000 AF

**Overall Ground Water Budget**
Inflow - Outflow = +/- Storage
43,000 - 74,000 = - 31,000 AF

Reference: Harrington, 2004
Summary

- Mountain Home Plateau contains both a GWMA and CGWA

- Groundwater level declines of ~120 feet over the last 35 years in the southwest area of the Cinder Cone CGWA (~3.5 ft/yr)

- Groundwater level declines of ~50 feet over the last 35 years near the Air Force base (~1.4 ft/yr)

- Water budget deficit in the regional system

- Mountain Home regional aquifer is recharge limited; consumptive use exceeds the rate of recharge
END
## Water Budget

**Ondrechen (2004)**

<table>
<thead>
<tr>
<th>Basin Inflow and Supply</th>
<th>Supply/Use (AFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canyon Creek yield</td>
<td>20,900</td>
</tr>
<tr>
<td>Little Camas Creek (imported)</td>
<td>9,500</td>
</tr>
<tr>
<td>Rattlesnake Creek yield</td>
<td>3,800</td>
</tr>
<tr>
<td>Ditto Creek and adjacent areas</td>
<td>4,100</td>
</tr>
<tr>
<td>Precipitation on rocky areas</td>
<td><strong>4,400</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42,700</strong></td>
</tr>
</tbody>
</table>

### Consumptive Use and Loss

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss to Snake River</td>
<td>1,500</td>
</tr>
<tr>
<td>Use by irrigated crops</td>
<td><strong>69,600</strong></td>
</tr>
<tr>
<td>Use by Municipal and Air Base</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73,600</strong></td>
</tr>
</tbody>
</table>

**Inflow Minus Use**  
-30,900
Water budgets for the consolidated hearing study area and the Cinder Cone comparison area

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Consolidated Hearing Study Area</th>
<th>Cinder Cone Comparison Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acres within Recharge Area</td>
<td>45,490</td>
<td>52,492</td>
</tr>
<tr>
<td>2</td>
<td>Precipitation (AFA) within Recharge Area</td>
<td>75,420</td>
<td>88,989</td>
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<tr>
<td>3</td>
<td>Actual Evapotranspiration (AFA) within Recharge Area</td>
<td>66,147</td>
<td>76,240</td>
</tr>
<tr>
<td>4</td>
<td>Acres within Non-recharge Area</td>
<td>177,447</td>
<td>181,307</td>
</tr>
<tr>
<td>5</td>
<td>Precipitation within Non-recharge Area (AFA)</td>
<td>175,662</td>
<td>162,111</td>
</tr>
<tr>
<td>6</td>
<td>Recharge from Precipitation in Non-recharge Area (AFA)</td>
<td>2,656</td>
<td>2,025</td>
</tr>
<tr>
<td>7</td>
<td>Irrigated Lands CIR (AFA) * Non-recharge Area</td>
<td>884</td>
<td>13,131</td>
</tr>
<tr>
<td>8</td>
<td>Surface Discharge Out of Area (AFA)</td>
<td>606</td>
<td>9,877</td>
</tr>
<tr>
<td></td>
<td>8a) Blacks Creek</td>
<td>506</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8b) Indian Creek Reservoir Evaporation</td>
<td>360</td>
<td>9,877</td>
</tr>
<tr>
<td></td>
<td>8c) Canyon Creek</td>
<td>206</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Surface Discharge Out of Area (AFA)</td>
<td>866</td>
<td>9,877</td>
</tr>
<tr>
<td>9</td>
<td>DCMI Consumptive Use Breakdown</td>
<td>3,059</td>
<td>1,165</td>
</tr>
<tr>
<td></td>
<td>Recharge + Non-recharge Areas (AFA):</td>
<td>317</td>
<td>797</td>
</tr>
<tr>
<td></td>
<td>9a) GW Rights</td>
<td>6</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>9b) Springs</td>
<td>170</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>9c) Surface Water</td>
<td>-4,809</td>
<td>-4,800</td>
</tr>
<tr>
<td></td>
<td>9d) Permit Volume</td>
<td>2,566</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>Total DCMI Consumptive Use (AFA)</td>
<td>3,059</td>
<td>1,165</td>
</tr>
<tr>
<td>10</td>
<td>Recharge (AFA) [Item#2-#3+#6-#8]</td>
<td>11,063</td>
<td>4,897</td>
</tr>
<tr>
<td>11</td>
<td>Recharge (cfs)</td>
<td>15.27</td>
<td>6.76</td>
</tr>
<tr>
<td>12</td>
<td>Net Recharge (AFA) [Item#10-#7-#9]</td>
<td>7,120</td>
<td>-9,399</td>
</tr>
<tr>
<td>13</td>
<td>Net Recharge (cfs)</td>
<td>9.83</td>
<td>-12.97</td>
</tr>
</tbody>
</table>
Brief Irrigation Development history:
- About ½ of surface water rights developed by ~1915 – not much else until after WWII. Rest developed before end of 1980s.
- Groundwater development started mostly after WWII and occurred mostly in 60s and 70s, also mostly ended in late 1980s.

Actual Acreage irrigated less than the 98K-acre area shown.
Regulation History

• 1891 – 1943: Various water use disputes, litigation & adjudication of water rights in separate surface water drainages in Basin 61
  • Resulted in designation of five water districts over time
  • Four of five districts currently active

• 2012: Water District 02 created, Snake River from Milner to Murphy
  • Includes some irrigated lands in Basin 61 along Snake River
Regulatory History – Moratoriums, CGWA, GWMA

- GW declines have been observed near pumping centers since the 1960s.

  - Based on 1981 IDWR Study that estimated withdrawal at 1.5X recharge

- 1982: Mountain Home Groundwater Management Area designated
  - Based on 1982 IDWR study that withdrawals exceed recharge

- 1984 Swan Falls agreement – Trust Water Area
  - Swan Falls controversy results in moratorium from 1977 thru 1988

- 1992 Snake River Moratorium (supplemental uses exempted)

- 1993 Snake R. Moratorium Order amended to exclude MH area

- 1996 – 2006 – Advisory Committee develops draft Management plan
Regulatory History

• 2012: I-84 corridor study determines ground water supplies are limited

• 2016: Water District 161 formed and measurement order issued
Reasons for Creating Water District 161

• SRBA is complete
  - SRBA Court issued Final Decree – August 24, 2014

• Administration is required for both surface & ground water rights
  - maintain current/accurate water right records
  - measure and report water use
  - address unauthorized uses, if any &/or as found
  - assure diversions within water right limits/descriptions

• Potential regulation of ground water rights in GWMA/CGWA
  - Director may limit ground water use until there is sufficient supply
  - Director may require measurement & reporting of gw use
    - necessary to evaluate withdrawals vs. recharge
    - necessary if limiting water use

• Potential conjunctive administration of surface & ground water rts.
  ( or administration of senior gw rts. vs. junior gw rights)
Goal of these administrative activities/designations are to exercise statutory authority to manage and sustain the resource.

Average Recharge

Volume

Withdrawals

Time

Studies, designations/moratoriums, management

corrective
WD Stats:
- Approximately 480 ground water rights within WD
- Approximately 270 water users
- Potential for >100K acre-feet of gw diversion – Likely closer to 80K
- About 340 - 360 wells will require meters and reporting
- Adopted 2017 budget of about $45K – local assistant watermaster

Water District is part of water mgmt. toolkit:
- Water use (measurement)/data collection
- Water Right regulation
Measurement Order Details:

- Order applies to irrig. diversions > 5 acres & non-irrigation diversions >0.24 cfs
  - Most domestic and stockwater uses exempt
  - Some sub-divisions included
- Meters to be installed by 2019 irrigation season (or January, 2019 for non-irrig.)
- Up to 340 - 360 wells will require meters and reporting
  - (some of these wells not used due to non-use, CRP etc.)
- Standard flow meters = magnetic (“mag”) flow meters
  - Variances limited
  - Mag meters about $2,500 - $3,500 for 10” diameter plus install
  - Meters should be read several times per year
  - Data entered/stored to IDWR database (WMIS)
Water District Current Status:
• 2017: district begins operations
  • Watermaster: Nick Miller, IDWR Western Regional Mgr.
  • Assist. watermaster: Ed Van Etten, Mtn. Home (started summer 2017)
  • Adopted 2017 budget of about $45K – local assistant watermaster
  • Advisory committee selected
  • Inventory of Groundwater Wells by Assistant WM
    • Over 120 wells inventoried
  • Some flow meter installations begin
  • Local users working towards possible cost-share grant opportunities
Near-term WD Activities/Goals:

- Full time local WM in 1-2 years (phase out IDWR staff)
  - Some follow-up compliance may be required with IDWR assistance
- IDWR will initiate review of imagery and water rights place of use 2017-2018
  - Notify users of any potential discrepancies & need for corrections via transfers
Potential Future Water District Management Activities:

- Diversion data used for more detailed supply-demand analysis.
- Respond to delivery calls, implement management or mitigation plans?
- Future is uncertain.
Questions?
Mountain Home Aquifer – Water Uses and Economic Importance

Presented by Brian Patton P.E., Executive Officer, Idaho Water Resource Board

September 17, 2017
Topics

• Uses of Water from the Mt. Home Aquifer
• Economic Importance
## Water Uses from the Mountain Home Aquifer

- **Irrigated Agriculture**: 69,900 AF/yr (IDWR)
- **City of Mountain Home**: 4,720 AF/yr (SPF 2017)
- **Mountain Home AFB**: 1,630 AF/yr (SPF 2016)
- **Rural Domestic**: ?

**TOTAL ESTIMATE**: 76,250 AF/yr
Economic Importance of Water Use - Agriculture

- Elmore County No. 8 in Idaho counties for total value of agricultural products sold (USDA) – Idaho is No. 2 or 3 agricultural state in the West

- Elmore County total market value of ag products sold is $350M (USDA 2012) – adding multiplier brings total economic impact to $600M

- Elmore County has about 90,000 irrigated agricultural acres with 30,000 acres supplied from aquifer
Economic Importance of Water Use - City

- Population of 14,000
- Business and industry
- Supports agriculture and AFB
2010 Economic Impact Analysis by MHAFB and Boise State University

- Total Economic Impact: $1.02 Billion annually
  - Direct Impact: $474 Million annually
  - Multiplier Impact: $546 Million annually
- 5,306 Direct Jobs
2015 Economic Impact Analysis by MHAFB

- Direct Impact: $342 Million annually
- 4,274 Direct Jobs

Did not report Multiplier Impact or Total Economic Impact
Questions?
MATERIALS MAY BE PROVIDED AT THE
IWRB MEETING
Mountain Home Air Force Base (MHAFB) Water Supply and Pipeline Project

Idaho Water Resource Board Meeting September 14th, 2017

Randall A. Broesch P.E. • Water Projects Section • Staff Engineer
Owner’s Advisor Update

• Project Delivery Method Selection

• Procurement Services – 2 Step Process
  • Pre-SOQ meeting August 24th / Submittals due September 26th
  • RFP scheduled to start in January 2018

• Raw Water Characteristic Study

• Water Treatment Pilot Study

• Technical Project Components
  • Cost Estimating
  • IDEQ Permitting/Certifications
  • Topographic Survey
  • Geotechnical Investigations
MHAFB Water Supply & Pipeline Project

Work In Progress

- Environmental Assessment (EA) Conducted by MHAFB & BLM
- Water Utility Service Agreement (WUSA)
- Revenue Bond Financing
- Procurement of Design-Build-Operate Services
- Revenue Bond Financing
- Water Right Process
- Permitting

Randall A. Broesch P.E. • Water Projects Section • Staff Engineer
Questions or Considerations?
MATERIALS MAY BE PROVIDED AT THE
IWRB MEETING
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