

# MEMORANDUM

**Date:** July 22, 2011  
**To:** Water Right File 37-8388  
**From:** medl  
**Re:** license review

---

## Special Data Entry

The SDRTR LLC. property is sited in an unusual location. The surveyed address for the subdivision containing this property is Homestead Entry Survey (H.E.S.) #389. Public Land Survey System addresses are not applicable. However, the IDWR forms and database configuration expect a Public Land Survey address for the place-of-use and the point-of-diversion. In order to complete the data entry, both the field examiner and I overlaid H.E.S. #389 with a virtual Public Land Survey grid. The PLS addresses assigned by this license are only for ease in locating features important to this water right. They are not intended to replace the official survey record.

The SDRTR LLC. property is identified by Blaine County as AM Lot 1B Blk 1 in the Warfield Hot Springs Subdivision.

## Applicant

Permit 37-8388 was originally issued to Bruce Gilbert on February 3, 1989. On May 25, 2000 the permit was assigned to Steven D. Reuther. On March 10, 2006 the Department sent a lapse notice to Steven D. Reuther for lack of submittal of either an acceptable proof statement or a request for an extension of time. On May 16, 2008 the permit was assigned to SDRTR, LLC. and James P. Speck, legal counsel for SDRTR, LLC., filed a Petition to Reinstate Lapsed Water Right Permit No. 37-8388 on behalf of the assignee. The Beneficial Use Field exam was conducted by Brockway Engineering PLLC on June 17, 2008. On July 7, 2008 a proof statement and Beneficial Use Field Report were submitted to the Department by James P. Speck. On July 14, 2008 the permit was reinstated to SDRTR, LLC. with no advance in priority date.

SDRTR LLC. is registered as #W46025 with ISOS. The address of record for this entity is in California. The primary residence may not be continuously occupied. A resident manager oversees day-to-day operation and maintenance of the property but James P. Speck of Speck & Aanestad is legal counsel and the local representative for the permit holder.

## Additional information request

The beneficial use field exam was conducted during the warmest part of the year when the main residence was unoccupied. Although exam photos show that the hardscape and diversion and distribution systems were in place, very little heat use was confirmed during the exam. The only temperature measurement provided was the mixing temperature of the geothermal water at the sump.

On March 4, 2011, I requested supplemental information to support actual heat extracted by this system be provided within 30 days. Charles E. Brockway provided a response on April 18, 2011. I have prepared an order to advance the priority date of the permit 15 days.

The response consisted primarily of engineering estimates of peak heat use which were then extrapolated to annual volumes. No heating load records have been provided. The actual heat extracted by the cascade of uses on this system is still unknown. Although the design assumptions could be challenged, at this time the Department appears willing to accept the engineering estimating methods as a substitute for actual use. This licensing review has been targeted primarily at an evaluation of the source data, not the methodology.

## **Source**

The geothermal source is Warfield Hot Spring which daylights approximately 230 ft to the north of the recommended point-of-diversion. The spatial data point 398012 (digitized by K Neeley in 2009) is the best likely location of that spring.

## **Point-of-Diversion**

Only one point-of-diversion was developed and recommended by the examiner. That point-of-diversion is a concrete sump located to the south and across Warm Springs Creek from the Warfield Hot Spring location. The sump is gravity fed by water entering perforated pipe laid in the alluvium adjacent to Warm Springs Creek. I created the POD shape for the sump based on July 31, 2008 coordinates provided by J Cooper (IDWR Southern region). The coordinates are: lat 43.64038, long -114.48719. This POD location compares well with the field examiner's notes and map.

## **Place-of-Use**

Only the two space heating places-of-use were depicted in aerial photography documentation submitted with the field exam report. On February 8, 2011, I requested clarification of the POU for the other uses from Brockway Engineering. On February 14, 2011, I received an updated aerial photo showing the space heating, snow melting and recreation shapes.

The updated photo shows that the examiner found the uses located in different PLSS grid locations than had been permitted but all the depicted POUs appeared to be contained within H.E.S. # 389. Because the department treats a H.E.S. similar to a government lot, no amendment will be needed before licensing.

The snow melting area depicted in the 2/14/2011 update, extended beyond SDRTR property into Sawtooth National Forest property. June 20-21, 2011, I requested electronic copies of the shape files related to this right and confirmation that the shape for snow melting crossed the property line. The revised snow melting shape file, (sent June 28, 2011), shows the snow melting use is confined to SDRTR property. The revised area is smaller than the design area used by the examiner for his snow melting volume recommendation. I use the smaller shape in my recommendation. I created the place-of-use shapes which represent the residential space heating.

## **Effluent Discharge**

According to the December 1, 2008 pump test report prepared by IDWR staff, overflow from the Robbins sump flows into Warm Spring Creek. Spent geothermal water does not appear to be re-injected into the source aquifer. From a meeting and conversation with C. E. Brockway June 30, 2011, I learned that the end terminal for all geothermal water uses in this system is the fire protection ponds. Those two ponds, which have been excavated into the groundwater table, receive the cascaded second or third use geothermal water. Water in excess of irrigation/fire protection needs, flows from the fire protection ponds overland, off the SDRTR property and into local surface water channels.

## **Water Use**

### Cold water uses

The original permit authorized domestic use of the geothermal water. The field examiner's report did not recommend domestic use but was silent about the contemporary source for the domestic water. Exam photos show piping labeled domestic cold water, and IDWR personnel found a sprinkler system in place during 2008 field visits.

I requested clarification of the domestic use from Brockway Engineering personnel. The source of the domestic water is now a cold-water well. The most likely candidate is well #390616 at spatial data point 354180 (GPSd by J Freitag). Both the main residence and the manager/contractor's residence are on the same domestic well. Overlap analysis did not show other water rights for domestic or irrigation use at this POU. Any sprinkler irrigation for fire protection could be covered by and limited to domestic well exemption amounts.

Domestic use is retained on the license to cover irrigation of the landscaping. My recommendation is for

a minimum standard rate and volume.

#### Hot water system capacity

The heat flow capacity of the heat exchangers has not been provided. The examiner recommended a rate for the license based on the hydraulic capacity of the pumping system. That capacity was found to range 200-206 gpm during pump tests conducted by the field examiner on June 27, 2008 and was confirmed by IDWR personnel October 21-22, 2008. The license rate characterizes the maximum recorded flow for simultaneous operation of the two submersible pumps.

The Proof of Beneficial Use statement, received July 7, 2008, gives the rate as 0.45 cfs. The pumping capacity and rates recommended in the original Beneficial Use Field Report, dated July 3, 2008, were also 0.45 cfs. However, in the additional information submitted April 18, 2011, rates were revised slightly upward to 0.46 cfs with predictable consequences to the dependant volume recommendations. I held my recommendations for licensing to the original rate 0.45 cfs.

Both pumping tests showed the system capable of delivering 0.45 cfs. for several hours. However, the IDWR pump test demonstrated a limit to long-term pumping. After 3.5 hours of continuous pumping at or near the hydraulic capacity, the level of the water in the Robbins sump had dropped to the pump intakes. In order to continue the test for the desired length of time, IDWR personnel throttled the pumping rate down until equilibrium was maintained. The sustainable, long-term pumping rate was found to be 160 gpm. The passive collection system supplying geothermal water to the Robbins sump cannot maintain long-term pumping at the pumping plant capacity.

#### Hot water uses

##### Recreation

The field examiner found a constructed spa/pool and estimated its dimensions at 12 ft wide by 24 ft long by 5 ft deep. The recreation place-of-use shape provided by Brockway Engineering is larger than those dimensions. However, the estimated dimensions from the field report, not the size of the shape provided, were used to calculate the recreation heat use.

The examiner recommended a recreation rate based on second-use geothermal water at 102.5 deg F, boosted to 104.9 deg F. The examiner recommended a volume is based on first-use geothermal water. Both amounts are estimates obtained Geo-Heat Center's Heatools spreadsheet with the pond dimensions oriented to a wind direction which would cause the most heat loss. I am able to reproduce the examiner's estimates.<sup>1</sup>

As a potential first use of the geothermal water, spa water temperatures exceeding industry safety standards (104 deg F) seem possible.

This open-air, spa/pool is located outside of the main residence. Overflow from the spa/pool flows by gravity and is temporarily stored in irrigation/fire protection ponds. If the spa/pool is maintained at the design target temperature of 100 deg F then the overflow water temperature would also be 100 deg F and too warm for direct use in irrigation. A pump house is located on the shore of the first of two ponds downstream from the spa/pool. Cooled geothermal water is the source of water used in the sprinkler irrigation/fire protection system.

There is no statutory requirement that all of the heat value be exhausted before a geothermal water is returned to the environment. Only that heat extraction be the first use. This system of uses is both heat and water consumptive.

---

<sup>1</sup> I have purchased a personal copy of the Geo-Heat Center's Direct Use Software. The software includes a Heatools spreadsheet which provides a calculation method for estimating heat loss from ponds due to convection, radiation, evaporation and conduction. I also found that reversing the orientation of the spa/pond with respect to the wind, while leaving the other inputs unchanged, yields a rate of 0.11 cfs and a volume of 26.1 AF.

### Water heating

The field examiner's report narrative states that geothermal water is used to preheat water entering the domestic water heaters. The temperature of the source is less than the temperature typically desired for hot water in domestic appliances (120 deg F). In this case, geothermal heat would be supplemental to a traditional heat source. Lacking data on the preheating, the examiner does not include a value for this heat use in his recommendation.

### Space heating

I requested and received verification of the dwellings from the Blaine County assessor's office. Both of the residences recommended for space heating use by the field examiner were built in 2002. It is likely that some heating system prevented damaging wintertime conditions in these residences prior to the field exam.

No historical records of actual heat demand, either traditional or geothermal, were provided in the exam report or with the examiner's supplemental information. Spot records of historical valve settings were available from the contractor-in-residence. Those estimated settings were not acceptable as a basis for a volume recommendation.

The assessor's Residential Characteristics summary for the main residence indicated 3 fireplaces in place. I believe that they are for used for aesthetics rather than for heat. In a June 30, 2011 conversation with Charles E. Brockway, he stated that geothermal water is the sole source for space heating.

Both the main residence and the manager-contractor's residence are heated by hydronic, radiant floor heating. This space heating system is not a direct use system. The geothermal water is isolated from the building heating system it serves. The two residences are partitioned into zones and heated by under-floor coils with a glycol as the exchange fluid. The exam photos of the mechanical room in the main residence show at least two heat exchangers in place. No information about the exchangers has been provided.

The examiner based his space heating recommendations on a spreadsheet which was created by IDWR and was intended for use by IDWR staff at the permitting stage in the water rights process<sup>2</sup>. The Department has explained to Brockway Engineering that it is a misapplication of the spreadsheet to use it as a substitute for an as-built, heating load analysis.

Brockway Engineering provided two spreadsheets with two different space heating recommendations. The first one was provided via email on December 27, 2010 to correct an oversight in the exam report submittals. The second was included in the supplemental information provided on April 18, 2011. The two spreadsheets do not use the same design temperatures and so yield different space heating peak rates and annual volumes. The space heating area used does not match the livable space given in the assessor documents. I correct that in my calculation.

As reality checks, I compared the Brockway Engineering recommendations to an extrapolation of the peak heating loads given by Musgrove Engineering for a smaller scale but similar hydronic space heating system (see permits 65-13912 and 65-13913). I also compared the examiner's recommendations to space heating rate and volume calculators developed by R Sterling<sup>3</sup>. I found that the peak design rate recommended by Brockway Engineering would fit within a similar range (25-35 BTU/hr-ft<sup>2</sup>) as these references.

---

<sup>2</sup> Administrator's Application Processing Memorandum, No. 23 (amended), Rate of Flow for Heating Use, Norman C. Young, September 28, 1992.

<sup>3</sup> Memo from Rick Sterling to Terry Blau, Re: Estimating annual water requirements for geothermal heating, March 25, 1988. The memo adapts a heating energy estimation method, which is described in the ASHRAE 1985 Fundamentals Handbook for application to geothermal space heating.

However, the recommended design volume does not compare well against those same references. The recommended volume calculation assumes that the peak design rate would be constant and applicable for a 273-day heating season. For a base 65, there are 40 to 45, degree-day periods per day for weather stations in this area. For example: the annual HDD (heating degree days) for a base 65 at Hailey 3 NNW, Idaho (NWS Co-Op station #103942) is given as 8131. The Hailey-Ketchum Airport shows 8591 HDD for 2008. Using Brockway Engineering's recommendation for 273 days of continuous heating would give an HDD of 12285. ( $45 \text{ HDD per day} \times 273 \text{ days} = 12285$ ). Therefore, the recommended volume appears excessive. I recommend a volume of 18 AF based on R Sterling-ASHRAE method which adjusts for weather by employing a HDD parameter. Refer to the attached spreadsheet.

#### Snow melting

The snow melting calculation for this right is modeled after the design submitted by Charles G. Brockway for the Clarendon Hot Springs (permit 37-8205). And that design is based on a Geo-Heat Center document.<sup>4</sup> I have a copy of that document and at my request C. G. Brockway provided me copies of his spreadsheets.

Unlike the residential space heating use on this system, the snow melting use is a direct use hydronic system. There is no heat exchange fluid. The geothermal water is piped into a radiant heating system below the grade of the drive and walkways. No information about the location or number of heating zones was provided in the exam narrative or supplements.

If the snow melting area is considered a single, monolithic slab, the maximum heat energy rate available to the snow melting system is insufficient to the task of eliminating snow. Even using the reduced snow melting shape (provided by Brockway Engineering, June 28, 2011), I find that the process would be stalled at the phase change, creating slush. The geothermal heat would be transmitted to the atmosphere through radiation and convection at the upper surface of the slush. Energy transmitted to the atmosphere does not contribute to the objective of snow melting and is therefore wasted. Once in the snow melting system, the geothermal water is not available for other uses. So a single slab, unzoned, snow melting system would waste both water and heat. The Department will not condone a use which is designed to waste water.

The examiners recommendations for snow melting were not possible without wasting the resource so snow melting would have been excluded from licensing. Because zoning for hydronic systems is standard practice, I requested additional information about the snow melting zones on July 12, 2011. The field examiner interviewed the contractor-operator and reported back on July 13, 2011. The SDRTR property has been divided into 6 snow melting zones. The contractor stated he can operate as many as 2 zones at a time. Given this information, I calculated rates and volumes by revising the snow melting spreadsheet provided by C. G. Brockway. With zone partitioning of the snow melting shape, and some prioritization of the zones, snow melting is possible without waste.

#### Snow melting volume

The examiner's snow melting volume recommendation is based on a calculation that the system can supply geothermal water at 0.45 cfs for 8 hours. This is not true. After the first 3.5 hours of steady withdrawal at 0.45 cfs, the source can only maintain pumping at 160 gpm or 0.36 cfs. (see capacity discussion above)

#### Snow melting rate

My interpretation and application of the Lund document resulted in a different approach to the rate and volume calculations than was used by Brockway Engineering. The Lund equation for total snow melting

---

<sup>4</sup> Lund J. W., Pavement Snow Melting, Geo-Heat Center Quarterly Bulletin, Vol. 21 No. 2, Klamath Falls, OR, pp. 12-19

go, has four, heat transfer rates which are summed to estimate the heat needed for any snow event. The four heat rates represent the heat requirements to progress through the states of water from a snow covered to a dry pavement. They coincide with phase changes that happen in series, not simultaneously. Unless the snow melting system is operating at the triple point of water then solid, liquid, and vapor phases of water would not coexist. The design parameters provided by Brockway are not triple point properties. The examiner's calculations do not recognize that the rates would be applied sequentially.

The governing rate for a snow melting use would be the heat of fusion (Lund's  $q_m$  rate equation). A system capable of delivering heat sufficient to melt snow would be capable of delivering the heat energy needed to warm the snow first. Therefore, two zones could be operated simultaneously, for example one warming snow, one melting snow, and not preclude other simultaneous heat uses.

It can be argued that the rate for heat transfer needed to overcome convection and radiation (Lund's  $q_h$  rate) could be appropriately applied for the duration of snow melting and I have included that rate in my calculation. I am uncomfortable recommending that hot water be used to evaporate cold water from an open-air, surface. I believe that the snow melting zones are designed with adequate runoff channeling, as these same zones would be expected to shed rainwater in warmer seasons. The time to make demands for efficient use of the resource is at the permit stage. So even though I would have preferred to exclude the heat rate of evaporation from my calculation, it is included in the snow melting rate and volume.

### **Status and Combined Use**

The license will be conditioned with a combined use domestic limit to cover the irrigation from geothermal.

### **Summary**

#### Domestic

The examiner does not recommend domestic use.

I recommend external domestic use to cover irrigation; rate 0.01 cfs, volume 0.6 AF.

#### Recreation

Examiner's recommendations: rate = 0.13 cfs, volume = 29.1 AF (This volume is based 2<sup>nd</sup> use of water).

I can agree with the examiner's scenarios and these recommendations.

#### Residential space heating

Examiner's recommendations: rate = 0.11 cfs, volume = 57.6 AF.

My recommendations: rate = 0.10 cfs based on a correction to the livable space, volume = 16.1 AF based on application of the ASHRAE degree-day method developed by R. Sterling.

#### Snow-melting space heating

Examiner's recommendation: rate = 0.46 cfs, volume = 63.7 AF.

My recommendations: rate = 0.14 cfs of first use water, volume = 83.4 AF first use water, 13.9 AF per zone to melt 6 zones.

My recommended overall rate = 0.36 cfs. This corresponds with the long-term capability of the sump collection system.

My recommended overall volume = 100.1 AF.

## MEMORANDUM

**Date:** July 14, 2011  
**To:** Water Right File 37-8388  
**From:** medl  
**Re:** phone log

---

I calculated that the snow melting use for this right would not be licensed if it was based on the single shape provided by Brockway Engineering. The mathematics indicated that snow melting would be unsuccessful.

I suspected that the shape was actually subdivided into zones, so I contacted C.E. Brockway on 7/11/2011 and requested more information about the snow melting zones.

He phoned back 7/13/2011 after interviewing the contractor. The snow melting shape is divided into 6 zones:

- Back deck
- Main upper deck
- Hot tub
- Car port
- Main driveway
- Roof

The contractor can operate the snow melting system in as many as 2 zones at a time.

Given this information, I recalculated the snow melting capability. The math supports snow melting in prioritized zones so the use can be licensed.

|                                                                        |              |                                     |                                   |
|------------------------------------------------------------------------|--------------|-------------------------------------|-----------------------------------|
| <b>ROBBINS TRUST</b>                                                   |              |                                     |                                   |
| <b>ROADWAY SNOW MELTING WITH GEOTHERMAL WATER</b>                      |              |                                     |                                   |
| Lund, John W. (2000). Pavement Snow Melting. Geo-Heat Center Bulletin. |              |                                     |                                   |
| Assumes direct-use hydronic method, buried pipelines.                  |              |                                     |                                   |
| Met data from Hailey station                                           |              |                                     |                                   |
| <b>SCENARIO: FIRST USE OF GEOTHERMAL WATER</b>                         |              |                                     |                                   |
| <b>DESIGN CONDITION:</b>                                               |              |                                     |                                   |
| <b>Parameter</b>                                                       | <b>Value</b> | <b>Units</b>                        |                                   |
| Total area (revised snow melt, shp)                                    | 21,489       | ft <sup>2</sup>                     |                                   |
| Rate of snowfall                                                       | 0.17         | inches of water equivalent per hour |                                   |
| Air temperature                                                        | -1.7         | F                                   | corrects a typo                   |
| Wind speed                                                             | 4.1          | mph                                 |                                   |
| Water film temperature                                                 | 33           | F                                   |                                   |
| Ratio of snow-free area to total                                       | 1            |                                     |                                   |
| Resource temperature                                                   | 115.5        | F                                   |                                   |
| Effluent temperature                                                   | 85           | F                                   |                                   |
| Road pavement heat loss                                                | 20%          |                                     |                                   |
| <b>CALCULATIONS:</b>                                                   |              |                                     |                                   |
| <b>Parameter</b>                                                       | <b>Value</b> | <b>Units</b>                        | <b>Comments</b>                   |
| Vapor pressure of air                                                  | 0.06         | in Hg                               |                                   |
| Heat of vaporization at film temp                                      | 1075.50      | Btu/lb                              |                                   |
| Sensible heat                                                          | 14.90        | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat of fusion                                                         | 126.82       | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat of evaporation                                                    | 18.67        | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat transfer (conv. & radiation)                                      | 54.36        | Btu/hr/ft <sup>2</sup>              |                                   |
| Unit heat required at road surface                                     | 214.74       | Btu/hr/ft <sup>2</sup>              |                                   |
| Unit heat required from pipes                                          | 268.43       | Btu/hr/ft <sup>2</sup>              |                                   |
| Total heat required                                                    | 5768196.3    | Btu/hr                              |                                   |
| Flow rate required                                                     | 378.24       | gpm                                 | not possible, exceeds capacity    |
|                                                                        | 0.84         | cfs                                 |                                   |
| Snow melt System Operation                                             | 150.0        | days                                |                                   |
| Snow melt System Operation                                             | 8.0          | hours/day                           |                                   |
| Diversion Volume required                                              | 83.58        | afa                                 |                                   |
| Formula: $V_{div} = Q \times D \times H/24 \times 1.9835$              |              |                                     |                                   |
|                                                                        |              |                                     | does not accomplish snow melt     |
|                                                                        |              |                                     | this scenario wastes heat & water |
|                                                                        |              |                                     | can not be licensed               |

|                                                           |              |                                     |                                   |
|-----------------------------------------------------------|--------------|-------------------------------------|-----------------------------------|
| <b>SCENARIO: SECOND USE OF GEOTHERMAL WATER</b>           |              |                                     |                                   |
| <b>DESIGN CONDITION:</b>                                  |              |                                     |                                   |
| <b>Parameter</b>                                          | <b>Value</b> | <b>Units</b>                        |                                   |
| Total area (revised snow melt, shp)                       | 21,489       | ft <sup>2</sup>                     |                                   |
| Rate of snowfall                                          | 0.17         | inches of water equivalent per hour |                                   |
| Air temperature                                           | -1.7         | F                                   |                                   |
| Wind speed                                                | 4.1          | mph                                 |                                   |
| Water film temperature                                    | 33           | F                                   |                                   |
| Ratio of snow-free area to total                          | 1            |                                     |                                   |
| Resource temperature                                      | 102.5        | F                                   |                                   |
| Effluent temperature                                      | 85           | F                                   |                                   |
| Road pavement heat loss                                   | 20%          |                                     |                                   |
| <b>CALCULATIONS:</b>                                      |              |                                     |                                   |
| <b>Parameter</b>                                          | <b>Value</b> | <b>Units</b>                        | <b>Comments</b>                   |
| Vapor pressure of air                                     | 0.06         | in Hg                               |                                   |
| Heat of vaporization at film temp                         | 1075.50      | Btu/lb                              |                                   |
| Sensible heat                                             | 14.90        | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat of fusion                                            | 126.82       | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat of evaporation                                       | 18.67        | Btu/hr/ft <sup>2</sup>              |                                   |
| Heat transfer (conv. & radiation)                         | 54.36        | Btu/hr/ft <sup>2</sup>              |                                   |
| Unit heat required at road surface                        | 214.74       | Btu/hr/ft <sup>2</sup>              |                                   |
| Unit heat required from pipes                             | 268.43       | Btu/hr/ft <sup>2</sup>              |                                   |
| Total heat required                                       | 5768196.3    | Btu/hr                              |                                   |
| Flow rate required                                        | 659.22       | gpm                                 | not possible, exceeds capacity    |
|                                                           | 1.47         | cfs                                 |                                   |
| Snow melt System Operation                                | 150.0        | days                                |                                   |
| Snow melt System Operation                                | 8.0          | hours/day                           |                                   |
| Diversion Volume required                                 | 145.67       | afa                                 |                                   |
| Formula: $V_{div} = Q \times D \times H/24 \times 1.9835$ |              |                                     |                                   |
|                                                           |              |                                     | does not accomplish snow melt     |
|                                                           |              |                                     | this scenario wastes heat & water |
|                                                           |              |                                     | can not be licensed               |

[illegible]

|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 522 | 523</ |
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

A vertical rectangular sheet of white paper featuring a light gray grid. The grid consists of horizontal and vertical lines forming small squares across the entire page. There are no margins, text, or other markings on the paper.

| SCENARIO: SECOND USE OF GEOTHERMAL WATER |  |  |  |
|------------------------------------------|--|--|--|
|                                          |  |  |  |

| DESIGN CONDITION: |  |  |  |
|-------------------|--|--|--|
| CONCRETE: C20/25  |  |  |  |
| STEEL: S235       |  |  |  |

| Parameter                | Value | Units |
|--------------------------|-------|-------|
| <b>DESIGN CONDITION:</b> |       |       |

|                                   |       |     |                                       |
|-----------------------------------|-------|-----|---------------------------------------|
| Area = revised snow melt, shp / 6 | 3,561 | #2  | 6 equal-sized zones: 1 zone at a time |
| Rate of snowfall                  | 0.17  |     | inches of water equivalent per hour   |
| Air temperature                   | -1.7  | F   |                                       |
| Wind speed                        | 4.1   | mph |                                       |
| Water film temperature            | 33    | F   |                                       |
| Ratio of snow-free area to total  | 1     |     |                                       |
| Resource temperature              | 102.5 | F   |                                       |
| Effluent temperature              | 85    | F   |                                       |
| Road pavement heat loss           | 20%   |     |                                       |

| Variable             | Value | Unit | Comments |
|----------------------|-------|------|----------|
| <b>CALCULATIONS:</b> |       |      |          |

| Parameter                                              | Value     | Units                  | Comments                                     |
|--------------------------------------------------------|-----------|------------------------|----------------------------------------------|
| Vapor pressure of air                                  | 0.06      | in Hg                  |                                              |
| Heat of vaporization at film temp                      | 1075.50   | Btu/lb                 |                                              |
| Sensible heat                                          | 14.90     | Btu/hr/ft <sup>2</sup> |                                              |
| Heat of fusion                                         | 126.82    | Btu/hr/ft <sup>2</sup> |                                              |
| Heat of evaporation                                    | 18.67     | Btu/hr/ft <sup>2</sup> |                                              |
| Heat transfer (conv. & radiation)                      | 54.36     | Btu/hr/ft <sup>2</sup> |                                              |
| Unit heat required at road surface                     | 214.74    | Btu/hr/ft <sup>2</sup> |                                              |
| Unit heat required from pipes                          | 268.43    | Btu/hr/ft <sup>2</sup> |                                              |
| Total heat required                                    | 961364.38 | Btu/hr                 |                                              |
| Flow rate required                                     | 109.87    | gpm                    |                                              |
|                                                        | 0.24      | cfs                    | exceeds my total rate available from 2nd-use |
| Snow melt System Operation                             | 150.0     | days                   |                                              |
| Snow melt System Operation                             | 8.0       | hours/day              |                                              |
| Division Volume required                               | 24.28     | afa                    |                                              |
| Formula: $Vdtr = Q \times D \times H/24 \times 1.9835$ |           |                        |                                              |
|                                                        |           |                        |                                              |
|                                                        |           |                        |                                              |
|                                                        |           |                        |                                              |

| Sterling Method                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|----------------------------------------------------------|-----------------------------------------------------------------------|--------|----|----------|------|-----|----------|----|---------------------------------------------------------------|--|--|
| Parameter                                                | V=(HL-DD*24*(Cd/(deltaT1*(K*C*deltaT2)))                              |        |    |          |      |     |          |    |                                                               |  |  |
| V                                                        | Heat value of the fuel ASHRAE or annual volume Sterling               |        |    |          |      |     |          |    |                                                               |  |  |
| HL                                                       | peak heating load in BTU/hr                                           |        |    |          |      |     |          |    |                                                               |  |  |
| DD                                                       | annual heating degree days                                            |        |    |          |      |     |          |    |                                                               |  |  |
| 24                                                       | 24 hrs/day                                                            |        |    |          |      |     |          |    |                                                               |  |  |
| Cd                                                       | correction factor, for standard construction choose from ASHRAE fig 1 |        |    |          |      |     |          |    |                                                               |  |  |
| deltaT1                                                  | design indoor temp minus design outdoor temp                          |        |    |          |      |     |          |    |                                                               |  |  |
| K                                                        | correction factor to account for losses. Use .90                      |        |    |          |      |     |          |    |                                                               |  |  |
| C                                                        | constant to correct for units                                         |        |    |          |      |     |          |    |                                                               |  |  |
| deltaT2                                                  | temp of incoming geothermal water minus temp of outgoing              |        |    |          |      |     |          |    |                                                               |  |  |
| Area of floor space                                      | liveable floor space in ft ^2 given by assessor                       |        |    |          |      |     |          |    |                                                               |  |  |
| Geo-Heat gives 5-20 BTU/hr per square ft. of floor space | 11489                                                                 |        |    |          |      |     |          |    |                                                               |  |  |
| Admin memo 23 suggests range 25-75 BTU/hr-sq.ft.         |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| Suggested Range BTU/hr-ft^2                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| HL (BTU/hr) design or peak heating load                  | DD                                                                    | hr/day | Cd | delta T1 | K    | C   | delta T2 |    |                                                               |  |  |
| 5                                                        | 57445                                                                 | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 10                                                       | 114890                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 15                                                       | 172335                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 20                                                       | 229780                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 25                                                       | 287225                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 30                                                       | 298,052.23                                                            | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 | estimated peak load using admin memo 23/ Venter spreadsheet   |  |  |
|                                                          | 344670                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 | extrapolated peak load from Musgrove peak design day          |  |  |
|                                                          | 372,721.22                                                            | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 35                                                       | 402115                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 36                                                       | 413604                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 | estimated peak load based on R Sterling graph for normal home |  |  |
| 40                                                       | 459560                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 45                                                       | 517005                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 50                                                       | 574450                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 55                                                       | 631895                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 60                                                       | 689340                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 65                                                       | 746785                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| 70                                                       | 804230                                                                | 8131   | 24 | 0.65     | 73.7 | 0.9 | 2720000  | 13 |                                                               |  |  |
| Range of calculated results                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| V (A/F) /yr                                              | V= (HL x DD x24 x Cd/(deltaT1 x K x C x deltaT2))                     |        |    |          |      |     |          |    |                                                               |  |  |
| 3 106694436                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 6 213388871                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 9 320083307                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 12 42677774                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 15 53347218                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 18 64016661                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 21 74686105                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 24 85355548                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 27 96024992                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 31 06694436                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
| 34 17363879                                              |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |
|                                                          |                                                                       |        |    |          |      |     |          |    |                                                               |  |  |

| Musgrove extrapolation/realty check |       |       |                               |
|-------------------------------------|-------|-------|-------------------------------|
| floor ft^2=                         | 2824  | 11489 |                               |
| BTU=                                | 91615 | x     | 94648 to 91computer printouts |
| BTU SDRTR                           | k =   | ##### | 91615 w/de-rated garage       |

## MEMORANDUM

**Date:** July 14, 2011  
**To:** Water Right File 37-8388  
**From:** medl  
**Re:** POU photo

---

These photos were provided by state office staff from the Water Distribution section. They were taken during the pumping test in October 2008.

The photo of the main house shows some of the lawn which may have been irrigated.

The photo of the fire protection pond shows the spent geothermal spa/pool water entering the pond and the pump house in the background..





# HAILEY 3 NNW, IDAHO

## Period of Record General Climate Summary - Heating Degree Days

| Station:(103942) HAILEY 3 NNW                         |      |      |      |      |     |      |      |      |      |      |      |      |        |
|-------------------------------------------------------|------|------|------|------|-----|------|------|------|------|------|------|------|--------|
| From Year=1893 To Year=1988                           |      |      |      |      |     |      |      |      |      |      |      |      |        |
| Heating Degree Days for Selected Base Temperature (F) |      |      |      |      |     |      |      |      |      |      |      |      |        |
| Base                                                  | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Annual |
| 65                                                    | 1418 | 1155 | 1055 | 673  | 413 | 209  | 38   | 55   | 259  | 574  | 959  | 1323 | 8131   |
| 60                                                    | 1263 | 1014 | 900  | 523  | 269 | 106  | 10   | 17   | 146  | 420  | 809  | 1168 | 6645   |
| 57                                                    | 1170 | 929  | 807  | 435  | 193 | 63   | 4    | 8    | 95   | 332  | 719  | 1075 | 5832   |
| 55                                                    | 1108 | 872  | 745  | 377  | 150 | 42   | 2    | 4    | 70   | 278  | 659  | 1013 | 5321   |
| 50                                                    | 953  | 731  | 590  | 243  | 69  | 12   | 0    | 1    | 28   | 161  | 510  | 858  | 4157   |

Heating Degree Day units are computed as the difference between the base temperature and the daily average temperature. (Base Temp. - Daily Ave. Temp.) One unit is accumulated for each degree Fahrenheit the average temperature is below the base temperature. Negative numbers are discarded. Example: If the days high temperature was 65 and the low temperature was 31, the base 50 heating degree day units is  $50 - ((65 + 31) / 2) = 2$ . This is done for each day of the month and summed.

Table updated on Jan 14, 2011

Months with 5 or more missing days are not considered

Years with 1 or more missing months are not considered

Western Regional Climate Center, [wrcc@dri.edu](mailto:wrcc@dri.edu)

[Main Site](#) [Mobile](#) [iPhone](#) [Lite](#) [Full Screen](#) [Downloads](#)[Sign In or Sign Up](#) [Mail](#) [Settings](#)[Favorites](#) You don't appear to have any favorites yet, or your cookies may be disabled. Recent Cities: [Ketchum, ID](#) | [Hailey, ID](#)[Local Weather](#)[Maps & Radar](#)[Severe Weather](#)[Photos & Video](#)[Blogs](#)[Travel & Activities](#)[Resources](#)

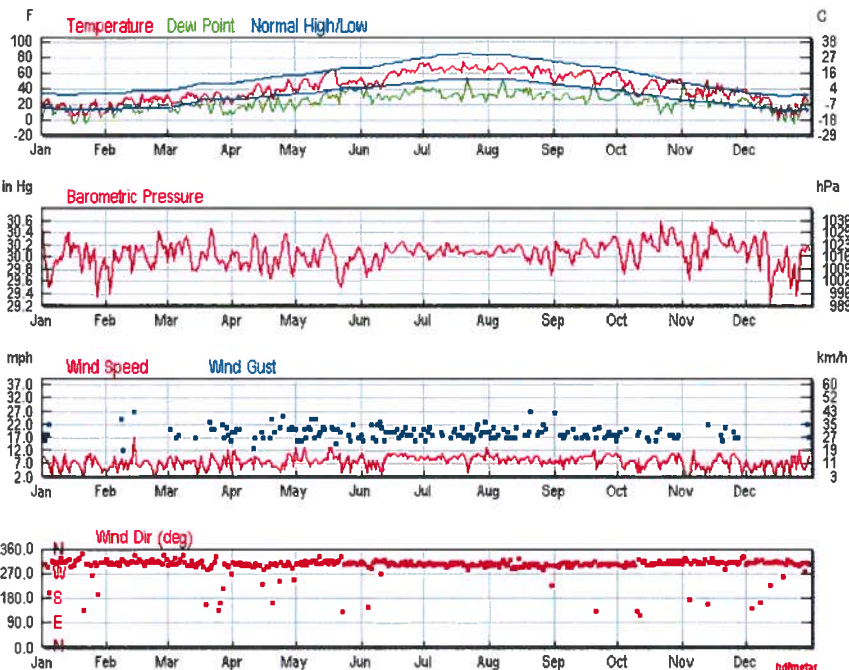
## History for Hailey, ID

January 1, 2008 through December 31, 2008 — [View Current Conditions](#)

January 1, 2008 through December 31, 2008

January 1 2008 - TO - December 31 2008 [Daily](#)[Weekly](#)[Monthly](#)[Custom](#)

|                               | Max      | Avg      | Min      | Sum     |
|-------------------------------|----------|----------|----------|---------|
| Temperature                   |          |          |          |         |
| Max Temperature               | 91 °F    | 53 °F    | 10 °F    |         |
| Mean Temperature              | 74 °F    | 42 °F    | 4 °F     |         |
| Min Temperature               | 62 °F    | 31 °F    | -4 °F    |         |
| Degree Days                   |          |          |          |         |
| Heating Degree Days (base 65) | 61       | 23       | 0        | 8591    |
| Cooling Degree Days (base 65) | 9        | 0        | 0        | 159     |
| Growing Degree Days (base 50) | 24       | 4        | 0        | 1579    |
| Dew Point                     |          |          |          |         |
| Dew Point                     | 57 °F    | 24 °F    | -27 °F   |         |
| Precipitation                 |          |          |          |         |
| Precipitation                 | 0.00 in  | 0.00 in  | 0.00 in  | 0.00 in |
| Snowdepth                     | 22.0 in  | 22.0 in  | 22.0 in  | -       |
| Wind                          |          |          |          |         |
| Wind                          | 24 mph   | 8 mph    | 0 mph    |         |
| Gust Wind                     | 34 mph   | 19 mph   | 9 mph    |         |
| Sea Level Pressure            |          |          |          |         |
| Sea Level Pressure            | 31.14 in | 30.06 in | 29.09 in |         |



### History Location

Airport: Recent: [KSUN](#)

### Trip Planner

Search our historical database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it will be!

Date:  

### Observations

| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|--------|
| Jan  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |        |
| 1    | 21         | 11  | 1   | 3              | -2  | -8  | 78           | 65  | 46  | 30.67                 | 30.59 | 30.46 | 20              | 11  | 10  | 13         | 10  | 16   | 0.00         |        |
| 2    | 30         | 22  | 14  | 12             | 7   | 3   | 68           | 61  | 43  | 30.45                 | 30.29 | 30.10 | 20              | 10  | 10  | 15         | 10  | 21   | 0.00         |        |
| 3    | 33         | 24  | 15  | 19             | 10  | 7   | 68           | 61  | 41  | 30.11                 | 30.02 | 29.85 | 20              | 12  | 10  | 14         | 9   | 16   | 0.00         |        |
| 4    | 33         | 26  | 19  | 32             | 22  | 16  | 100          | 79  | 64  | 29.86                 | 29.72 | 29.40 | 10              | 8   | 0   | 13         | 8   | 18   | 0.00         | Snow   |
| 5    | 33         | 26  | 19  | 32             | 24  | 16  | 100          | 83  | 64  | 29.95                 | 29.51 | 29.42 | 10              | 6   | 1   | 16         | 6   | 29   | 0.00         | Snow   |
| 6    | 28         | 18  | 8   | 23             | 17  | 3   | 100          | 87  | 59  | 29.77                 | 29.58 | 29.51 | 12              | 7   | 0   | 12         | 3   | -    | 0.00         | Snow   |
| 7    | 19         | 12  | 5   | 16             | 6   | 0   | 93           | 81  | 72  | 30.02                 | 29.81 | 29.77 | 10              | 8   | 1   | 14         | 10  | 20   | 0.00         | Snow   |
| 8    | 21         | 14  | 8   | 18             | 8   | 1   | 93           | 83  | 73  | 30.04                 | 29.96 | 29.83 | 10              | 7   | 1   | 13         | 8   | -    | 0.00         | Snow   |
| 9    | 28         | 19  | 10  | 27             | 14  | 7   | 93           | 87  | 69  | 30.06                 | 29.88 | 29.81 | 20              | 11  | 2   | 9          | 6   | -    | 0.00         | Snow   |
| 10   | 26         | 18  | 12  | 23             | 16  | 10  | 93           | 87  | 74  | 30.06                 | 30.00 | 29.88 | 10              | 7   | 0   | 8          | 3   | -    | 0.00         | Snow   |
| 11   | 30         | 21  | 12  | 23             | 19  | 10  | 100          | 86  | 69  | 30.12                 | 29.96 | 29.87 | 20              | 9   | 1   | 15         | 5   | -    | 0.00         | Snow   |
| 12   | 28         | 22  | 15  | 19             | 14  | 10  | 86           | 78  | 63  | 30.19                 | 30.15 | 30.12 | 20              | 11  | 10  | 16         | 11  | 20   | 0.00         |        |
| 13   | 26         | 16  | 6   | 18             | 11  | 3   | 93           | 85  | 64  | 30.48                 | 30.31 | 30.20 | 20              | 12  | 1   | 10         | 6   | -    | 0.00         |        |
| 14   | 21         | 11  | 1   | 14             | 6   | 0   | 92           | 86  | 63  | 30.50                 | 30.41 | 30.09 | 15              | 8   | 0   | 10         | 4   | -    | 0.00         | Fog    |
| 15   | 28         | 18  | 6   | 21             | 8   | -4  | 86           | 61  | 36  | 30.19                 | 30.01 | 29.87 | 20              | 12  | 2   | 20         | 7   | 34   | 0.00         | Snow   |
| 16   | 12         | 6   | 0   | 0              | -5  | -9  | 78           | 63  | 48  | 30.29                 | 30.23 | 30.19 | 15              | 10  | 10  | 17         | 8   | -    | 0.00         |        |
| 17   | 15         | 6   | -4  | 1              | -5  | -9  | 85           | 73  | 53  | 30.20                 | 30.14 | 30.04 | 20              | 12  | 10  | 9          | 8   | -    | 0.00         |        |
| 18   | 17         | 8   | -2  | 9              | -1  | -6  | 92           | 79  | 63  | 30.29                 | 30.20 | 30.15 | 20              | 11  | 10  | 10         | 7   | -    | 0.00         |        |
| 19   | 21         | 12  | 3   | 14             | 6   | 0   | 92           | 81  | 68  | 30.29                 | 30.18 | 29.90 | 20              | 12  | 10  | 10         | 6   | -    | 0.00         |        |
| 20   | 23         | 19  | 15  | 19             | 18  | 12  | 100          | 92  | 86  | 29.89                 | 29.76 | 29.61 | 10              | 4   | 0   | 9          | 4   | -    | 0.00         | Snow   |
| 21   | 19         | 10  | 1   | 16             | 9   | -4  | 100          | 87  | 62  | 30.20                 | 29.86 | 29.71 | 15              | 6   | 1   | 9          | 2   | -    | 0.00         | Snow   |
| 22   | 15         | 6   | -2  | 1              | -5  | -9  | 85           | 73  | 53  | 30.28                 | 30.23 | 30.20 | 10              | 10  | 10  | 16         | 10  | 20   | 0.00         |        |
| 23   | 17         | 9   | 1   | 1              | -3  | -6  | 85           | 72  | 49  | 30.24                 | 30.18 | 29.99 | 10              | 10  | 10  | 12         | 9   | -    | 0.00         |        |
| 24   | 26         | 16  | 5   | 21             | 6   | -2  | 93           | 76  | 58  | 29.98                 | 29.83 | 29.70 | 20              | 8   | 0   | 15         | 11  | 21   | 0.00         | Snow   |
| 25   | 33         | 22  | 12  | 19             | 14  | 7   | 100          | 85  | 52  | 30.19                 | 30.01 | 29.87 | 20              | 10  | 1   | 13         | 6   | -    | 0.00         | Snow   |
| 26   | 32         | 21  | 10  | 21             | 12  | 5   | 93           | 78  | 64  | 30.20                 | 30.15 | 30.03 | 20              | 12  | 5   | 14         | 10  | -    | 0.00         | Snow   |
| 27   | 32         | 26  | 19  | 32             | 20  | 14  | 100          | 87  | 80  | 30.03                 | 29.72 | 29.24 | 15              | 7   | 0   | 15         | 8   | -    | 0.00         | Snow   |
| 28   | 32         | 18  | 3   | 32             | 18  | -2  | 100          | 79  | 27  | 29.77                 | 29.35 | 29.09 | 15              | 7   | 0   | 16         | 7   | 21   | 0.00         | Snow   |
| 29   | 17         | 9   | 1   | 16             | 6   | -2  | 93           | 86  | 79  | 29.84                 | 29.76 | 29.61 | 10              | 6   | 0   | 12         | 6   | -    | 0.00         | Snow   |
| 30   | 30         | 16  | 1   | 10             | 3   | -2  | 92           | 80  | 34  | 30.06                 | 29.79 | 29.63 | 20              | 11  | 2   | 12         | 4   | -    | 0.00         |        |
| 31   | 19         | 14  | 10  | 18             | 10  | 5   | 93           | 85  | 79  | 30.06                 | 29.98 | 29.70 | 10              | 5   | 0   | 8          | 5   | -    | 0.00         | Snow   |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events |
| Feb  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |        |
| 1    | 24         | 14  | 3   | 19             | 9   | -2  | 100          | 85  | 31  | 29.94                 | 29.81 | 29.70 | 15              | 10  | 2   | 9          | 4   | -    | 0.00         | Snow   |
| 2    | 21         | 10  | 0   | 18             | 10  | 0   | 100          | 85  | 73  | 29.94                 | 29.84 | 29.55 | 10              | 7   | 0   | 9          | 5   | -    | 0.00         | Snow   |
| 3    | 28         | 24  | 19  | 23             | 18  | 14  | 100          | 89  | 69  | 29.55                 | 29.41 | 29.30 | 10              | 4   | 0   | 12         | 6   | 17   | 0.00         | Snow   |
| 4    | 23         | 16  | 10  | 14             | 10  | 3   | 93           | 72  | 58  | 30.09                 | 29.78 | 29.56 | 15              | 11  | 10  | 12         | 6   | -    | 0.00         |        |
| 5    | 17         | 12  | 6   | 12             | 3   | -2  | 93           | 72  | 53  | 30.19                 | 30.13 | 30.03 | 20              | 9   | 0   | 15         | 10  | 20   | 0.00         | Snow   |
| 6    | 24         | 15  | 6   | 14             | 11  | 1   | 93           | 84  | 63  | 30.09                 | 29.99 | 29.91 | 20              | 7   | 0   | 12         | 4   | -    | 0.00         | Snow   |
| 7    | 33         | 22  | 12  | 27             | 14  | 7   | 93           | 81  | 58  | 30.07                 | 29.91 | 29.73 | 10              | 5   | 0   | 20         | 6   | 32   | 0.00         | Snow   |
| 8    | 33         | 22  | 10  | 16             | 10  | 5   | 86           | 71  | 41  | 30.11                 | 30.01 | 29.98 | 20              | 11  | 10  | 18         | 9   | 24   | 0.00         |        |
| 9    | 35         | 22  | 10  | 28             | 15  | 9   | 92           | 83  | 69  | 30.28                 | 30.16 | 30.09 | 20              | 11  | 10  | 12         | 5   | 12   | 0.00         |        |
| 10   | 35         | 28  | 21  | 27             | 21  | 18  | 93           | 83  | 69  | 30.26                 | 30.17 | 30.07 | 20              | 12  | 10  | 14         | 8   | -    | 0.00         |        |
| 11   | 39         | 28  | 17  | 23             | 18  | 14  | 100          | 78  | 42  | 30.21                 | 30.12 | 30.07 | 20              | 11  | 10  | 17         | 5   | 29   | 0.00         |        |
| 12   | 35         | 27  | 19  | 27             | 20  | 14  | 100          | 82  | 65  | 30.27                 | 30.19 | 29.94 | 20              | 12  | 10  | 13         | 8   | -    | 0.00         |        |
| 13   | 33         | 28  | 24  | 27             | 20  | 10  | 93           | 74  | 41  | 29.93                 | 29.75 | 29.62 | 20              | 12  | 10  | 18         | 7   | 24   | 0.00         | Snow   |
| 14   | 30         | 22  | 12  | 16             | 10  | 5   | 79           | 55  | 43  | 30.12                 | 29.92 | 29.81 | 20              | 11  | 10  | 23         | 17  | 32   | 0.00         |        |

|      |            |     |     |                |     |     |              |     |     |                       |       |       |                 |     |     |            |     |      |              |             |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|-------------|
|      | 26         | 18  | 10  | 18             | 9   | 5   | 86           | 74  | 58  | 30.27                 | 30.19 | 30.12 | 20              | 12  | 10  | 10         | 7   | -    | 0.00         |             |
| 16   | 28         | 20  | 12  | 19             | 13  | 9   | 93           | 81  | 69  | 30.16                 | 30.10 | 30.04 | 20              | 10  | 7   | 10         | 6   | -    | 0.00         | Snow        |
| 17   | 30         | 18  | 6   | 18             | 9   | 3   | 92           | 79  | 55  | 30.21                 | 30.13 | 30.04 | 20              | 13  | 10  | 10         | 6   | -    | 0.00         |             |
| 18   | 53         | 32  | 10  | 16             | 10  | 5   | 86           | 74  | 15  | 30.23                 | 30.19 | 30.16 | 20              | 11  | 10  | 10         | 7   | -    | 0.00         |             |
| 19   | 35         | 24  | 14  | 21             | 14  | 10  | 86           | 70  | 48  | 30.17                 | 30.10 | 30.00 | 10              | 10  | 10  | 12         | 8   | -    | 0.00         |             |
| 20   | 32         | 26  | 17  | 19             | 15  | 12  | 86           | 69  | 55  | 30.01                 | 29.95 | 29.89 | 15              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 21   | 32         | 23  | 14  | 19             | 13  | 9   | 86           | 74  | 55  | 29.92                 | 29.89 | 29.85 | 15              | 11  | 10  | 10         | 7   | -    | 0.00         |             |
| 22   | 32         | 28  | 24  | 30             | 24  | 18  | 100          | 83  | 69  | 29.97                 | 29.79 | 29.73 | 10              | 6   | 0   | 12         | 6   | -    | 0.00         | Snow        |
| 23   | 30         | 28  | 26  | 28             | 24  | 19  | 100          | 86  | 69  | 30.04                 | 29.92 | 29.80 | 15              | 9   | 1   | 10         | 3   | -    | 0.00         | Snow        |
| 24   | 35         | 30  | 26  | 30             | 28  | 23  | 100          | 92  | 75  | 29.96                 | 29.83 | 29.77 | 10              | 4   | 0   | 10         | 2   | -    | 0.00         | Snow        |
| 25   | 35         | 30  | 23  | 32             | 26  | 19  | 93           | 88  | 75  | 30.39                 | 30.12 | 29.97 | 20              | 10  | 1   | 9          | 5   | -    | 0.00         | Snow        |
| 26   | 33         | 26  | 19  | 25             | 18  | 12  | 93           | 77  | 52  | 30.47                 | 30.42 | 30.38 | 20              | 10  | 7   | 14         | 8   | -    | 0.00         |             |
| 27   | 35         | 28  | 21  | 27             | 20  | 16  | 86           | 78  | 56  | 30.38                 | 30.27 | 30.10 | 20              | 10  | 10  | 10         | 7   | -    | 0.00         |             |
| 28   | 33         | 24  | 15  | 25             | 19  | 12  | 93           | 85  | 69  | 30.23                 | 30.15 | 30.12 | 15              | 10  | 10  | 9          | 5   | -    | 0.00         |             |
| 29   | 39         | 29  | 19  | 27             | 19  | 16  | 93           | 78  | 56  | 30.24                 | 30.18 | 30.03 | 20              | 12  | 10  | 13         | 6   | -    | 0.00         |             |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |
| Mar  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
| 1    | 42         | 33  | 24  | 28             | 21  | 9   | 81           | 62  | 30  | 30.07                 | 29.91 | 29.78 | 15              | 11  | 10  | 24         | 9   | 34   | 0.00         |             |
| 2    | 32         | 26  | 21  | 18             | 10  | 3   | 64           | 53  | 30  | 30.36                 | 30.21 | 30.07 | 15              | 10  | 10  | 17         | 10  | 22   | 0.00         |             |
| 3    | 28         | 20  | 12  | 27             | 11  | 3   | 100          | 66  | 51  | 30.37                 | 30.23 | 29.90 | 20              | 9   | 2   | 12         | 8   | -    | 0.00         | Snow        |
| 4    | 33         | 24  | 15  | 27             | 16  | 9   | 100          | 68  | 51  | 30.09                 | 29.94 | 29.86 | 20              | 11  | 0   | 12         | 5   | 18   | 0.00         | Snow        |
| 5    | 28         | 22  | 15  | 18             | 12  | 7   | 80           | 66  | 54  | 30.20                 | 30.15 | 30.09 | 20              | 11  | 10  | 15         | 10  | 17   | 0.00         |             |
| 6    | 32         | 23  | 14  | 16             | 9   | 3   | 79           | 64  | 47  | 30.33                 | 30.24 | 30.19 | 15              | 11  | 10  | 13         | 8   | 18   | 0.00         |             |
| 7    | 32         | 24  | 15  | 21             | 14  | 9   | 79           | 67  | 47  | 30.32                 | 30.26 | 30.10 | 15              | 11  | 10  | 12         | 7   | -    | 0.00         |             |
| 8    | 33         | 28  | 24  | 28             | 23  | 19  | 87           | 76  | 64  | 30.15                 | 30.06 | 30.02 | 20              | 11  | 4   | 10         | 5   | -    | 0.00         | Snow        |
| 9    | 35         | 30  | 24  | 27             | 21  | 16  | 93           | 74  | 52  | 30.32                 | 30.23 | 30.16 | 20              | 12  | 10  | 12         | 8   | -    | 0.00         |             |
| 10   | 37         | 29  | 21  | 27             | 20  | 12  | 86           | 73  | 48  | 30.40                 | 30.35 | 30.32 | 10              | 10  | 10  | 9          | 7   | -    | 0.00         |             |
| 11   | 44         | 36  | 28  | 27             | 21  | 18  | 74           | 62  | 34  | 30.33                 | 30.24 | 30.12 | 20              | 10  | 10  | 18         | 8   | 22   | 0.00         |             |
| 12   | 37         | 30  | 23  | 21             | 17  | 12  | 74           | 63  | 45  | 30.10                 | 30.06 | 29.96 | 10              | 10  | 10  | 14         | 7   | -    | 0.00         |             |
| 13   | 39         | 34  | 28  | 30             | 20  | 14  | 93           | 65  | 39  | 29.93                 | 29.80 | 29.72 | 15              | 10  | 2   | 13         | 8   | 20   | 0.00         | Rain , Snow |
| 14   | 35         | 28  | 21  | 25             | 18  | 12  | 93           | 68  | 52  | 29.83                 | 29.79 | 29.77 | 15              | 11  | 10  | 15         | 8   | 20   | 0.00         |             |
| 15   | 39         | 32  | 24  | 32             | 23  | 18  | 93           | 80  | 74  | 29.80                 | 29.77 | 29.73 | 20              | 9   | 2   | 10         | 3   | -    | 0.00         | Snow        |
| 16   | 32         | 24  | 17  | 21             | 17  | 10  | 86           | 73  | 55  | 30.06                 | 29.86 | 29.78 | 15              | 11  | 10  | 10         | 6   | -    | 0.00         |             |
| 17   | 33         | 26  | 19  | 27             | 15  | 9   | 80           | 64  | 54  | 30.10                 | 30.06 | 30.02 | 10              | 10  | 10  | 13         | 10  | -    | 0.00         |             |
| 18   | 41         | 30  | 19  | 34             | 23  | 16  | 93           | 82  | 64  | 30.17                 | 30.10 | 30.03 | 20              | 10  | 2   | 15         | 6   | 22   | 0.00         | Rain , Snow |
| 19   | 39         | 34  | 30  | 34             | 28  | 21  | 93           | 78  | 56  | 30.08                 | 30.03 | 29.86 | 20              | 10  | 3   | 9          | 4   | -    | 0.00         | Rain        |
| 20   | 37         | 32  | 26  | 32             | 25  | 10  | 100          | 79  | 33  | 30.16                 | 29.97 | 29.87 | 15              | 10  | 10  | 18         | 4   | 28   | 0.00         |             |
| 21   | 35         | 27  | 19  | 25             | 18  | 7   | 93           | 73  | 30  | 30.38                 | 30.22 | 30.15 | 15              | 11  | 0   | 18         | 7   | 28   | 0.00         | Snow        |
| 22   | 32         | 24  | 15  | 14             | 8   | 3   | 64           | 53  | 40  | 30.51                 | 30.47 | 30.42 | 15              | 12  | 10  | 17         | 11  | 20   | 0.00         |             |
| 23   | 37         | 28  | 19  | 21             | 14  | 9   | 68           | 60  | 33  | 30.43                 | 30.33 | 30.13 | 15              | 11  | 10  | 16         | 9   | 20   | 0.00         |             |
| 24   | 42         | 34  | 26  | 34             | 25  | 19  | 100          | 72  | 49  | 30.11                 | 30.03 | 29.99 | 10              | 10  | 3   | 12         | 8   | -    | 0.00         | Rain , Snow |
| 25   | 41         | 36  | 30  | 32             | 30  | 27  | 100          | 90  | 61  | 30.00                 | 29.97 | 29.96 | 20              | 11  | 10  | 13         | 6   | -    | 0.00         |             |
| 26   | 39         | 34  | 28  | 30             | 26  | 10  | 100          | 81  | 33  | 29.94                 | 29.90 | 29.86 | 20              | 8   | 0   | 13         | 4   | 17   | 0.00         | Snow        |
| 27   | 30         | 26  | 21  | 27             | 14  | 3   | 93           | 61  | 32  | 30.11                 | 29.96 | 29.86 | 10              | 10  | 5   | 20         | 7   | 28   | 0.00         |             |
| 28   | 33         | 22  | 10  | 27             | 7   | -2  | 100          | 60  | 31  | 30.09                 | 29.93 | 29.62 | 20              | 8   | 0   | 15         | 10  | 17   | 0.00         | Snow        |
| 29   | 32         | 26  | 19  | 28             | 10  | -6  | 100          | 53  | 24  | 29.98                 | 29.78 | 29.62 | 20              | 10  | 10  | 18         | 6   | 26   | 0.00         |             |
| 30   | 48         | 30  | 12  | 21             | 6   | 1   | 68           | 51  | 32  | 30.42                 | 29.87 | 29.76 | 20              | 12  | 10  | 21         | 12  | 20   | 0.00         |             |
| 31   | 30         | 24  | 19  | 19             | 13  | 1   | 93           | 66  | 29  | 30.17                 | 29.96 | 29.82 | 20              | 12  | 2   | 16         | 5   | 16   | 0.00         | Snow        |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |

|      | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|-------------|
| 1    | 35         | 22  | 10  | 10             | 6   | 0   | 73           | 55  | 30  | 30.17                 | 30.12 | 30.02 | 20              | 10  | 10  | 15         | 10  | 20   | 0.00         |             |
| 2    | 39         | 27  | 15  | 16             | 9   | 3   | 63           | 53  | 31  | 30.05                 | 30.01 | 29.92 | 20              | 10  | 10  | 16         | 12  | 21   | 0.00         |             |
| 3    | 37         | 27  | 17  | 19             | 12  | 7   | 63           | 52  | 35  | 30.18                 | 30.11 | 30.04 | 15              | 10  | 10  | 16         | 8   | 20   | 0.00         |             |
| 4    | 44         | 32  | 21  | 28             | 15  | 9   | 75           | 56  | 34  | 30.15                 | 30.05 | 29.79 | 20              | 11  | 10  | 13         | 9   | 20   | 0.00         |             |
| 5    | 37         | 29  | 21  | 21             | 15  | 9   | 69           | 53  | 35  | 29.87                 | 29.80 | 29.77 | 20              | 11  | 10  | 12         | 5   | -    | 0.00         |             |
| 6    | 39         | 32  | 24  | 27             | 18  | 12  | 75           | 61  | 45  | 29.92                 | 29.87 | 29.85 | 20              | 12  | 5   | 12         | 7   | -    | 0.00         | Snow        |
| 7    | 39         | 30  | 21  | 25             | 17  | 12  | 74           | 61  | 33  | 29.99                 | 29.91 | 29.89 | 20              | 12  | 10  | 18         | 7   | 21   | 0.00         |             |
| 8    | 37         | 29  | 21  | 18             | 13  | 9   | 63           | 53  | 30  | 29.99                 | 29.91 | 29.78 | 20              | 12  | 10  | 14         | 8   | -    | 0.00         |             |
| 9    | 37         | 32  | 28  | 28             | 21  | 18  | 81           | 66  | 55  | 29.97                 | 29.78 | 29.75 | 20              | 10  | 4   | 10         | 8   | -    | 0.00         | Snow        |
| 10   | 42         | 34  | 26  | 19             | 14  | 3   | 60           | 48  | 24  | 30.20                 | 29.98 | 29.89 | 20              | 11  | 10  | 14         | 9   | 16   | 0.00         |             |
| 11   | 42         | 33  | 24  | 19             | 15  | 9   | 64           | 52  | 31  | 30.41                 | 30.32 | 30.04 | 10              | 10  | 10  | 12         | 5   | 13   | 0.00         |             |
| 12   | 51         | 40  | 28  | 28             | 22  | 18  | 69           | 55  | 33  | 30.43                 | 30.39 | 30.36 | 20              | 10  | 10  | 15         | 10  | 17   | 0.00         |             |
| 13   | 60         | 46  | 33  | 34             | 28  | 25  | 75           | 59  | 27  | 30.38                 | 30.32 | 30.17 | 20              | 11  | 10  | 13         | 9   | -    | 0.00         |             |
| 14   | 62         | 48  | 35  | 37             | 28  | 25  | 75           | 56  | 26  | 30.12                 | 29.94 | 29.56 | 15              | 10  | 10  | 13         | 9   | 18   | 0.00         |             |
| 15   | 50         | 39  | 28  | 28             | 19  | 7   | 86           | 50  | 28  | 29.96                 | 29.70 | 29.60 | 20              | 12  | 2   | 20         | 6   | 24   | 0.00         | Snow        |
| 16   | 39         | 32  | 24  | 19             | 11  | 7   | 56           | 44  | 30  | 30.14                 | 30.06 | 29.99 | 20              | 11  | 10  | 12         | 7   | 17   | 0.00         |             |
| 17   | 48         | 36  | 24  | 27             | 19  | 3   | 69           | 56  | 17  | 30.24                 | 30.16 | 30.06 | 15              | 10  | 10  | 10         | 7   | -    | 0.00         |             |
| 18   | 53         | 42  | 32  | 28             | 25  | 21  | 75           | 59  | 28  | 30.03                 | 29.95 | 29.79 | 15              | 10  | 10  | 13         | 8   | 21   | 0.00         |             |
| 19   | 50         | 44  | 35  | 34             | 30  | 19  | 81           | 67  | 37  | 29.73                 | 29.65 | 29.49 | 20              | 12  | 10  | 15         | 8   | 17   | 0.00         | Rain        |
| 20   | 37         | 32  | 24  | 27             | 16  | -6  | 86           | 60  | 18  | 29.94                 | 29.65 | 29.55 | 20              | 13  | 10  | 21         | 6   | 28   | 0.00         | Snow        |
| 21   | 35         | 26  | 17  | 30             | 10  | 5   | 93           | 55  | 30  | 30.00                 | 29.97 | 29.96 | 20              | 13  | 10  | 14         | 6   | 21   | 0.00         |             |
| 22   | 51         | 38  | 24  | 25             | 17  | 14  | 69           | 54  | 28  | 30.08                 | 30.00 | 29.86 | 20              | 11  | 10  | 12         | 6   | -    | 0.00         |             |
| 23   | 46         | 39  | 32  | 36             | 30  | 19  | 100          | 71  | 34  | 29.83                 | 29.81 | 29.78 | 20              | 10  | 2   | 12         | 5   | 20   | 0.00         | Rain , Snow |
| 24   | 46         | 36  | 26  | 28             | 21  | 9   | 87           | 65  | 22  | 30.17                 | 29.96 | 29.85 | 10              | 10  | 10  | 20         | 4   | 26   | 0.00         |             |
| 25   | 46         | 37  | 28  | 21             | 16  | 5   | 64           | 48  | 18  | 31.14                 | 30.16 | 30.06 | 20              | 12  | 10  | 17         | 7   | 30   | 0.00         |             |
| 26   | 50         | 37  | 24  | 21             | 10  | 5   | 52           | 37  | 20  | 30.43                 | 30.35 | 30.25 | 15              | 10  | 10  | 12         | 5   | -    | 0.00         |             |
| 27   | 59         | 44  | 30  | 45             | 17  | 7   | 93           | 48  | 14  | 30.44                 | 30.39 | 30.23 | 15              | 11  | 10  | 16         | 10  | 21   | 0.00         |             |
| 28   | 66         | 52  | 37  | 30             | 22  | 12  | 56           | 39  | 15  | 30.22                 | 30.12 | 29.94 | 20              | 11  | 10  | 15         | 11  | 24   | 0.00         |             |
| 29   | 60         | 48  | 37  | 30             | 27  | 16  | 75           | 51  | 22  | 29.90                 | 29.77 | 29.57 | 20              | 12  | 10  | 16         | 10  | 26   | 0.00         |             |
| 30   | 44         | 37  | 30  | 25             | 20  | 12  | 75           | 56  | 27  | 29.82                 | 29.67 | 29.60 | 20              | 14  | 10  | 22         | 6   | 26   | 0.00         |             |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |
| May  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
| 1    | 46         | 39  | 32  | 27             | 12  | -2  | 80           | 39  | 13  | 30.13                 | 29.99 | 29.85 | 20              | 11  | 10  | 17         | 13  | 25   | 0.00         |             |
| 2    | 51         | 34  | 21  | 19             | 16  | 7   | 68           | 53  | 19  | 30.20                 | 30.17 | 30.13 | 10              | 10  | 10  | 17         | 9   | 17   | 0.00         |             |
| 3    | 55         | 44  | 32  | 21             | 19  | 10  | 64           | 49  | 19  | 30.13                 | 30.09 | 29.96 | 20              | 11  | 10  | 12         | 8   | 16   | 0.00         |             |
| 4    | 62         | 48  | 33  | 27             | 25  | 16  | 75           | 55  | 16  | 30.06                 | 30.02 | 29.99 | 10              | 10  | 10  | 12         | 8   | 16   | 0.00         |             |
| 5    | 68         | 52  | 37  | 28             | 26  | 19  | 65           | 52  | 18  | 30.09                 | 30.07 | 29.94 | 20              | 10  | 10  | 17         | 13  | 22   | 0.00         |             |
| 6    | 66         | 52  | 39  | 28             | 27  | 21  | 65           | 48  | 19  | 29.96                 | 29.94 | 29.83 | 20              | 10  | 10  | 14         | 10  | 18   | 0.00         |             |
| 7    | 60         | 52  | 44  | 34             | 29  | 21  | 61           | 46  | 22  | 29.90                 | 29.84 | 29.77 | 10              | 10  | 10  | 18         | 7   | 25   | 0.00         |             |
| 8    | 55         | 44  | 33  | 30             | 24  | 10  | 75           | 55  | 19  | 29.95                 | 29.91 | 29.83 | 15              | 10  | 10  | 13         | 6   | 23   | 0.00         |             |
| 9    | 53         | 44  | 35  | 27             | 21  | 16  | 56           | 45  | 22  | 30.08                 | 29.85 | 29.79 | 20              | 11  | 10  | 22         | 7   | 29   | 0.00         |             |
| 10   | 53         | 40  | 28  | 21             | 19  | 16  | 64           | 56  | 26  | 30.20                 | 30.14 | 30.08 | 20              | 10  | 10  | 12         | 8   | 17   | 0.00         |             |
| 11   | 60         | 48  | 37  | 28             | 24  | 19  | 60           | 48  | 20  | 30.02                 | 29.95 | 29.82 | 10              | 10  | 10  | 20         | 9   | 31   | 0.00         |             |
| 12   | 48         | 39  | 30  | 27             | 21  | 12  | 69           | 56  | 29  | 29.96                 | 29.84 | 29.81 | 20              | 11  | 10  | 16         | 7   | 20   | 0.00         |             |
| 13   | 60         | 45  | 30  | 23             | 20  | 16  | 64           | 53  | 19  | 30.17                 | 30.10 | 30.02 | 10              | 10  | 10  | 13         | 7   | 24   | 0.00         |             |
| 14   | 64         | 52  | 41  | 34             | 31  | 28  | 70           | 60  | 28  | 30.19                 | 30.12 | 30.08 | 10              | 10  | 10  | 13         | 8   | 24   | 0.00         |             |
| 15   | 71         | 56  | 42  | 37             | 33  | 30  | 70           | 49  | 27  | 30.40                 | 30.32 | 30.26 | 10              | 10  | 10  | 16         | 9   | 24   | 0.00         |             |
| 16   | 78         | 61  | 44  | 39             | 36  | 34  | 66           | 58  | 21  | 30.42                 | 30.39 | 30.29 | 10              | 10  | 10  | 14         | 9   | -    | 0.00         |             |

|      | 80         | 62  | 46  | 30             | 28  | 25  | 50           | 37  | 15  | 30.35                 | 30.33 | 30.27 | 20              | 10  | 10  | 20         | 13  | 25   | 0.00         |                        |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|------------------------|
| 18   | 82         | 66  | 51  | 41             | 29  | 25  | 47           | 34  | 15  | 30.21                 | 30.17 | 30.05 | 10              | 10  | 10  | 22         | 13  | 26   | 0.00         |                        |
| 19   | 80         | 65  | 50  | 37             | 33  | 18  | 54           | 40  | 10  | 30.11                 | 30.07 | 30.02 | 15              | 10  | 10  | 16         | 9   | 24   | 0.00         |                        |
| 20   | 78         | 64  | 50  | 32             | 29  | 28  | 47           | 36  | 17  | 30.09                 | 30.02 | 29.68 | 10              | 10  | 10  | 14         | 10  | 18   | 0.00         |                        |
| 21   | 53         | 47  | 41  | 37             | 32  | 18  | 81           | 63  | 24  | 29.70                 | 29.68 | 29.64 | 20              | 11  | 10  | 18         | 9   | 28   | 0.00         |                        |
| 22   | 48         | 44  | 41  | 32             | 22  | 18  | 57           | 43  | 34  | 29.62                 | 29.54 | 29.45 | 20              | 11  | 10  | 16         | 11  | 23   | 0.00         |                        |
| 23   | 53         | 46  | 39  | 41             | 38  | 36  | 100          | 86  | 54  | 29.62                 | 29.51 | 29.47 | 15              | 10  | 3   | 9          | 4   | -    | 0.00         | Rain ,<br>Thunderstorm |
| 24   | 57         | 48  | 39  | 41             | 38  | 32  | 93           | 81  | 41  | 29.84                 | 29.78 | 29.74 | 20              | 10  | 10  | 8          | 6   | -    | 0.00         | Rain ,<br>Thunderstorm |
| 25   | 60         | 48  | 37  | 39             | 35  | 34  | 87           | 77  | 39  | 29.92                 | 29.92 | 29.87 | 20              | 10  | 10  | 13         | 8   | 20   | 0.00         |                        |
| 26   | 55         | 48  | 42  | 43             | 38  | 36  | 82           | 76  | 51  | 29.87                 | 29.83 | 29.78 | 20              | 11  | 10  | 15         | 10  | 18   | 0.00         | Rain ,<br>Thunderstorm |
| 27   | 60         | 51  | 42  | 45             | 43  | 39  | 100          | 86  | 45  | 30.05                 | 30.00 | 29.96 | 20              | 11  | 5   | 9          | 4   | 16   | 0.00         | Rain                   |
| 28   | 57         | 49  | 41  | 43             | 40  | 37  | 93           | 82  | 51  | 30.03                 | 29.97 | 29.94 | 20              | 11  | 5   | 15         | 8   | 22   | 0.00         | Rain ,<br>Thunderstorm |
| 29   | 60         | 50  | 41  | 43             | 37  | 34  | 87           | 75  | 36  | 30.02                 | 29.99 | 29.98 | 20              | 12  | 10  | 12         | 8   | -    | 0.00         |                        |
| 30   | 57         | 47  | 37  | 43             | 37  | 34  | 87           | 78  | 47  | 30.14                 | 30.09 | 30.06 | 20              | 11  | 10  | 10         | 7   | 18   | 0.00         |                        |
| 31   | 64         | 50  | 39  | 39             | 37  | 34  | 81           | 74  | 32  | 30.17                 | 30.17 | 30.11 | 20              | 10  | 10  | 14         | 8   | 18   | 0.00         |                        |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events                 |
| Jun  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |                        |
| 1    | 62         | 54  | 46  | 45             | 41  | 39  | 81           | 66  | 42  | 30.09                 | 30.08 | 30.04 | 15              | 11  | 10  | 16         | 11  | 21   | 0.00         | Rain ,<br>Thunderstorm |
| 2    | 62         | 50  | 39  | 39             | 36  | 30  | 87           | 75  | 30  | 30.06                 | 30.04 | 29.99 | 10              | 10  | 10  | 16         | 10  | 17   | 0.00         |                        |
| 3    | 53         | 47  | 41  | 37             | 29  | 23  | 70           | 54  | 35  | 29.98                 | 29.94 | 29.85 | 20              | 11  | 10  | 14         | 8   | -    | 0.00         | Rain                   |
| 4    | 51         | 42  | 37  | 43             | 39  | 37  | 100          | 90  | 62  | 29.72                 | 29.67 | 29.64 | 20              | 11  | 5   | 10         | 4   | -    | 0.00         | Rain                   |
| 5    | 57         | 47  | 37  | 37             | 31  | 28  | 81           | 68  | 44  | 29.87                 | 29.82 | 29.79 | 10              | 10  | 10  | 13         | 8   | 17   | 0.00         |                        |
| 6    | 55         | 48  | 42  | 37             | 31  | 10  | 76           | 56  | 18  | 29.81                 | 29.78 | 29.76 | 10              | 10  | 10  | 17         | 5   | 29   | 0.00         | Rain                   |
| 7    | 57         | 44  | 32  | 25             | 22  | 14  | 69           | 53  | 18  | 29.96                 | 29.92 | 29.88 | 20              | 10  | 10  | 14         | 8   | 17   | 0.00         |                        |
| 8    | 57         | 48  | 39  | 30             | 26  | 21  | 65           | 51  | 30  | 30.10                 | 30.06 | 30.03 | 10              | 10  | 10  | 14         | 5   | 16   | 0.00         |                        |
| 9    | 62         | 50  | 39  | 34             | 29  | 27  | 66           | 56  | 30  | 30.09                 | 30.06 | 29.93 | 10              | 10  | 10  | 13         | 8   | 25   | 0.00         |                        |
| 10   | 51         | 46  | 42  | 46             | 35  | 7   | 93           | 68  | 17  | 29.89                 | 29.80 | 29.77 | 10              | 10  | 10  | 21         | 5   | 33   | 0.00         |                        |
| 11   | 55         | 42  | 30  | 28             | 27  | 23  | 87           | 69  | 31  | 29.94                 | 29.90 | 29.86 | 20              | 12  | 10  | 14         | 3   | 24   | 0.00         |                        |
| 12   | 64         | 50  | 35  | 36             | 27  | 16  | 87           | 57  | 19  | 30.16                 | 30.04 | 30.02 | 20              | 11  | 10  | 12         | 9   | 16   | 0.00         |                        |
| 13   | 66         | 52  | 37  | 36             | 30  | 28  | 75           | 56  | 30  | 30.25                 | 30.23 | 30.17 | 10              | 10  | 10  | 12         | 9   | 21   | 0.00         |                        |
| 14   | 73         | 58  | 42  | 36             | 30  | 21  | 61           | 47  | 14  | 30.14                 | 30.12 | 30.07 | 20              | 10  | 10  | 17         | 11  | 23   | 0.00         |                        |
| 15   | 75         | 60  | 44  | 34             | 25  | 21  | 49           | 36  | 18  | 30.10                 | 30.09 | 30.05 | 20              | 10  | 10  | 13         | 10  | 21   | 0.00         |                        |
| 16   | 78         | 62  | 46  | 36             | 30  | 27  | 62           | 41  | 15  | 30.10                 | 30.08 | 30.05 | 10              | 10  | 10  | 18         | 11  | 20   | 0.00         |                        |
| 17   | 78         | 64  | 50  | 34             | 31  | 27  | 50           | 41  | 15  | 30.14                 | 30.11 | 30.09 | 10              | 10  | 10  | 15         | 11  | 22   | 0.00         |                        |
| 18   | 73         | 60  | 46  | 34             | 30  | 27  | 57           | 41  | 22  | 30.18                 | 30.16 | 30.14 | 10              | 9   | 1   | 13         | 10  | 20   | 0.00         |                        |
| 19   | 71         | 56  | 42  | 34             | 28  | 25  | 61           | 43  | 19  | 30.23                 | 30.19 | 30.17 | 10              | 10  | 10  | 13         | 10  | 18   | 0.00         |                        |
| 20   | 78         | 60  | 44  | 32             | 26  | 23  | 49           | 37  | 17  | 30.29                 | 30.25 | 30.24 | 10              | 10  | 10  | 17         | 11  | 21   | 0.00         |                        |
| 21   | 84         | 66  | 51  | 37             | 31  | 30  | 47           | 39  | 15  | 30.29                 | 30.27 | 30.21 | 10              | 10  | 10  | 14         | 10  | 20   | 0.00         |                        |
| 22   | 75         | 66  | 57  | 45             | 40  | 34  | 59           | 42  | 22  | 30.23                 | 30.19 | 30.15 | 10              | 10  | 10  | 20         | 11  | 33   | 0.00         |                        |
| 23   | 75         | 62  | 48  | 41             | 37  | 27  | 66           | 53  | 17  | 30.17                 | 30.13 | 30.10 | 10              | 10  | 10  | 16         | 9   | 21   | 0.00         |                        |
| 24   | 78         | 64  | 50  | 37             | 32  | 30  | 50           | 43  | 21  | 30.14                 | 30.11 | 30.09 | 10              | 10  | 10  | 17         | 10  | 22   | 0.00         |                        |
| 25   | 78         | 62  | 48  | 37             | 34  | 30  | 54           | 46  | 21  | 30.09                 | 30.09 | 30.05 | 10              | 10  | 10  | 16         | 10  | 21   | 0.00         |                        |
| 26   | 78         | 64  | 51  | 41             | 36  | 32  | 51           | 43  | 18  | 30.07                 | 30.03 | 29.99 | 20              | 11  | 10  | 15         | 10  | 25   | 0.00         |                        |
| 27   | 75         | 62  | 51  | 41             | 36  | 34  | 58           | 46  | 27  | 30.19                 | 30.11 | 30.06 | 10              | 10  | 10  | 14         | 9   | 16   | 0.00         |                        |
| 28   | 82         | 66  | 53  | 46             | 44  | 37  | 63           | 56  | 20  | 30.28                 | 30.22 | 30.19 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |                        |
| 29   | 87         | 70  | 55  | 46             | 39  | 36  | 51           | 45  | 16  | 30.28                 | 30.25 | 30.22 | 10              | 10  | 10  | 17         | 9   | 22   | 0.00         |                        |
| 30   | 91         | 73  | 55  | 46             | 40  | 28  | 55           | 40  | 10  | 30.25                 | 30.20 | 30.00 | 20              | 11  | 10  | 15         | 10  | 25   | 0.00         |                        |

| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events                 |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|------------------------|
| Jul  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |                        |
| 1    | 84         | 72  | 60  | 46             | 41  | 34  | 52           | 40  | 17  | 30.16                 | 30.13 | 30.04 | 10              | 10  | 10  | 18         | 9   | 22   | 0.00         |                        |
| 2    | 86         | 70  | 53  | 41             | 38  | 36  | 58           | 43  | 18  | 30.13                 | 30.10 | 30.04 | 10              | 10  | 10  | 14         | 9   | 17   | 0.00         |                        |
| 3    | 91         | 73  | 55  | 43             | 37  | 34  | 51           | 38  | 13  | 30.11                 | 30.08 | 29.98 | 10              | 10  | 10  | 15         | 10  | 21   | 0.00         |                        |
| 4    | 86         | 73  | 60  | 45             | 38  | 36  | 45           | 34  | 19  | 29.98                 | 29.97 | 29.95 | 10              | 10  | 10  | 14         | 8   | 26   | 0.00         |                        |
| 5    | 77         | 64  | 51  | 43             | 38  | 34  | 54           | 46  | 22  | 30.07                 | 30.03 | 29.99 | 20              | 10  | 10  | 13         | 9   | 20   | 0.00         |                        |
| 6    | 78         | 64  | 53  | 46             | 42  | 39  | 63           | 53  | 24  | 30.07                 | 30.02 | 30.00 | 10              | 10  | 10  | 12         | 9   | -    | 0.00         |                        |
| 7    | 80         | 66  | 51  | 45             | 38  | 37  | 58           | 45  | 21  | 30.14                 | 30.07 | 30.02 | 10              | 10  | 10  | 13         | 9   | -    | 0.00         |                        |
| 8    | 80         | 65  | 53  | 43             | 36  | 34  | 47           | 39  | 23  | 30.20                 | 30.13 | 30.08 | 20              | 11  | 10  | 15         | 10  | 16   | 0.00         |                        |
| 9    | 84         | 68  | 53  | 43             | 37  | 34  | 48           | 42  | 18  | 30.20                 | 30.17 | 30.10 | 10              | 10  | 10  | 17         | 9   | 22   | 0.00         |                        |
| 10   | 86         | 68  | 51  | 39             | 29  | 27  | 44           | 31  | 12  | 30.08                 | 30.06 | 29.99 | 10              | 10  | 10  | 15         | 11  | 22   | 0.00         |                        |
| 11   | 75         | 62  | 51  | 32             | 29  | 18  | 38           | 32  | 14  | 30.17                 | 30.04 | 29.98 | 10              | 10  | 10  | 12         | 8   | -    | 0.00         |                        |
| 12   | 82         | 64  | 46  | 34             | 26  | 21  | 43           | 33  | 11  | 30.30                 | 30.25 | 30.18 | 20              | 10  | 10  | 12         | 7   | -    | 0.00         |                        |
| 13   | 82         | 66  | 51  | 36             | 31  | 28  | 44           | 37  | 14  | 30.23                 | 30.21 | 30.14 | 10              | 10  | 10  | 14         | 9   | 18   | 0.00         |                        |
| 14   | 84         | 68  | 53  | 36             | 31  | 21  | 44           | 32  | 10  | 30.16                 | 30.10 | 30.08 | 10              | 10  | 10  | 12         | 9   | 18   | 0.00         |                        |
| 15   | 84         | 70  | 55  | 37             | 30  | 25  | 41           | 29  | 11  | 30.13                 | 30.11 | 30.01 | 20              | 11  | 10  | 15         | 10  | 23   | 0.00         |                        |
| 16   | 82         | 68  | 53  | 41             | 34  | 32  | 47           | 38  | 19  | 30.17                 | 30.15 | 30.11 | 15              | 10  | 10  | 15         | 10  | 20   | 0.00         |                        |
| 17   | 82         | 66  | 53  | 41             | 34  | 30  | 51           | 39  | 21  | 30.20                 | 30.17 | 30.12 | 10              | 10  | 10  | 14         | 9   | 18   | 0.00         |                        |
| 18   | 78         | 66  | 53  | 39             | 34  | 32  | 47           | 40  | 20  | 30.08                 | 30.06 | 30.03 | 10              | 10  | 10  | 15         | 10  | 22   | 0.00         |                        |
| 19   | 80         | 61  | 44  | 43             | 23  | 19  | 82           | 31  | 12  | 30.12                 | 30.07 | 30.06 | 10              | 10  | 10  | 16         | 11  | 21   | 0.00         |                        |
| 20   | 89         | 74  | 59  | 41             | 31  | 21  | 34           | 28  | 12  | 30.05                 | 30.02 | 29.98 | 20              | 12  | 10  | 14         | 10  | 18   | 0.00         |                        |
| 21   | 80         | 70  | 59  | 50             | 38  | 36  | 42           | 39  | 28  | 30.14                 | 30.09 | 30.06 | 20              | 11  | 10  | 12         | 8   | 17   | 0.00         |                        |
| 22   | 78         | 68  | 59  | 57             | 54  | 39  | 88           | 70  | 26  | 30.09                 | 30.07 | 30.01 | 20              | 12  | 4   | 15         | 4   | 24   | 0.00         | Rain ,<br>Thunderstorm |
| 23   | 80         | 65  | 50  | 45             | 40  | 34  | 67           | 50  | 18  | 30.16                 | 30.11 | 30.04 | 20              | 11  | 10  | 14         | 9   | 18   | 0.00         |                        |
| 24   | 82         | 68  | 53  | 41             | 38  | 32  | 58           | 45  | 16  | 30.15                 | 30.11 | 30.08 | 20              | 11  | 10  | 14         | 9   | 16   | 0.00         |                        |
| 25   | 87         | 68  | 53  | 36             | 28  | 25  | 35           | 29  | 16  | 30.15                 | 30.13 | 30.10 | 20              | 10  | 10  | 15         | 10  | 17   | 0.00         |                        |
| 26   | 87         | 71  | 55  | 37             | 31  | 25  | 41           | 31  | 11  | 30.10                 | 30.06 | 30.02 | 20              | 10  | 10  | 15         | 10  | 26   | 0.00         |                        |
| 27   | 84         | 68  | 53  | 41             | 31  | 25  | 44           | 34  | 11  | 30.08                 | 30.05 | 29.99 | 10              | 10  | 10  | 14         | 11  | 26   | 0.00         |                        |
| 28   | 82         | 66  | 53  | 41             | 32  | 28  | 47           | 35  | 17  | 30.10                 | 30.06 | 30.02 | 10              | 10  | 10  | 14         | 10  | 22   | 0.00         |                        |
| 29   | 80         | 66  | 51  | 52             | 34  | 25  | 60           | 40  | 13  | 30.12                 | 30.10 | 30.08 | 10              | 10  | 10  | 14         | 10  | 23   | 0.00         |                        |
| 30   | 75         | 62  | 50  | 39             | 33  | 25  | 50           | 40  | 15  | 30.08                 | 30.06 | 30.05 | 20              | 11  | 10  | 18         | 8   | 28   | 0.00         |                        |
| 31   | 82         | 64  | 50  | 32             | 23  | 19  | 36           | 28  | 14  | 30.14                 | 30.10 | 30.06 | 10              | 10  | 10  | 17         | 13  | 21   | 0.00         |                        |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events                 |
| Aug  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |                        |
| 1    | 84         | 70  | 55  | 37             | 34  | 23  | 47           | 37  | 11  | 30.04                 | 30.00 | 29.98 | 20              | 11  | 10  | 16         | 10  | 21   | 0.00         |                        |
| 2    | 80         | 66  | 53  | 43             | 33  | 30  | 44           | 37  | 20  | 30.04                 | 30.02 | 30.00 | 20              | 10  | 10  | 14         | 10  | 18   | 0.00         |                        |
| 3    | 80         | 66  | 51  | 37             | 33  | 25  | 54           | 39  | 13  | 30.08                 | 30.03 | 29.99 | 10              | 10  | 10  | 13         | 9   | 28   | 0.00         |                        |
| 4    | 84         | 68  | 51  | 36             | 32  | 28  | 47           | 36  | 14  | 30.16                 | 30.09 | 30.05 | 10              | 10  | 10  | 13         | 10  | 17   | 0.00         |                        |
| 5    | 87         | 71  | 55  | 32             | 29  | 27  | 38           | 29  | 13  | 30.20                 | 30.17 | 30.14 | 10              | 10  | 10  | 16         | 11  | 18   | 0.00         |                        |
| 6    | 87         | 72  | 57  | 46             | 36  | 34  | 44           | 35  | 17  | 30.24                 | 30.20 | 30.12 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |                        |
| 7    | 86         | 72  | 59  | 52             | 44  | 43  | 55           | 45  | 27  | 30.19                 | 30.17 | 30.10 | 10              | 10  | 10  | 12         | 8   | 16   | 0.00         |                        |
| 8    | 82         | 71  | 62  | 54             | 51  | 46  | 68           | 57  | 28  | 30.11                 | 30.08 | 30.04 | 15              | 10  | 10  | 15         | 9   | 23   | 0.00         | Rain ,<br>Thunderstorm |
| 9    | 82         | 68  | 55  | 54             | 44  | 27  | 67           | 54  | 13  | 30.09                 | 30.07 | 30.03 | 20              | 10  | 10  | 13         | 7   | 20   | 0.00         | Thunderstorm           |
| 10   | 78         | 64  | 50  | 32             | 29  | 25  | 43           | 36  | 14  | 30.13                 | 30.11 | 30.08 | 10              | 10  | 10  | 15         | 10  | 23   | 0.00         |                        |
| 11   | 75         | 60  | 48  | 34             | 30  | 27  | 50           | 39  | 18  | 30.20                 | 30.14 | 30.11 | 10              | 10  | 10  | 15         | 8   | 17   | 0.00         |                        |
| 12   | 82         | 64  | 46  | 36             | 28  | 21  | 46           | 33  | 10  | 30.15                 | 30.09 | 30.00 | 20              | 10  | 10  | 13         | 9   | 18   | 0.00         |                        |
| 13   | 82         | 66  | 51  | 43             | 31  | 27  | 52           | 31  | 15  | 30.15                 | 30.11 | 30.05 | 20              | 10  | 10  | 14         | 10  | 18   | 0.00         |                        |

| 14   | 84         | 68  | 53  | 50             | 38  | 36  | 59           | 40  | 19  | 30.22                 | 30.18 | 30.13 | 10              | 10  | 10  | 16         | 9   | 21   | 0.00         |                    |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|--------------------|
| 15   | 80         | 65  | 50  | 50             | 39  | 37  | 62           | 47  | 21  | 30.25                 | 30.21 | 30.15 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |                    |
| 16   | 80         | 65  | 50  | 52             | 37  | 34  | 54           | 44  | 21  | 30.25                 | 30.20 | 30.09 | 20              | 10  | 10  | 12         | 9   | -    | 0.00         |                    |
| 17   | 84         | 68  | 53  | 50             | 38  | 32  | 54           | 40  | 16  | 30.15                 | 30.10 | 30.01 | 15              | 10  | 10  | 13         | 9   | 16   | 0.00         |                    |
| 18   | 87         | 70  | 53  | 48             | 35  | 30  | 44           | 34  | 13  | 30.08                 | 30.02 | 29.90 | 20              | 11  | 10  | 14         | 9   | 18   | 0.00         |                    |
| 19   | 78         | 68  | 57  | 45             | 41  | 34  | 55           | 44  | 20  | 29.97                 | 29.94 | 29.92 | 10              | 10  | 10  | 13         | 10  | 21   | 0.00         |                    |
| 20   | 77         | 62  | 46  | 46             | 33  | 30  | 57           | 42  | 22  | 30.01                 | 29.98 | 29.87 | 10              | 10  | 10  | 14         | 9   | 23   | 0.00         |                    |
| 21   | 69         | 61  | 53  | 46             | 41  | 36  | 72           | 56  | 28  | 29.92                 | 29.88 | 29.87 | 20              | 11  | 10  | 18         | 7   | 31   | 0.00         |                    |
| 22   | 68         | 54  | 41  | 34             | 27  | 21  | 57           | 42  | 25  | 30.22                 | 30.09 | 30.00 | 10              | 10  | 10  | 17         | 8   | -    | 0.00         |                    |
| 23   | 80         | 64  | 48  | 46             | 27  | 21  | 43           | 35  | 12  | 30.20                 | 30.17 | 30.10 | 10              | 10  | 10  | 15         | 10  | 20   | 0.00         |                    |
| 24   | 87         | 70  | 53  | 36             | 31  | 28  | 41           | 34  | 15  | 30.18                 | 30.15 | 30.09 | 20              | 9   | 7   | 16         | 10  | 20   | 0.00         |                    |
| 25   | 86         | 70  | 55  | 41             | 32  | 25  | 44           | 32  | 11  | 30.00                 | 29.97 | 29.77 | 20              | 11  | 10  | 14         | 9   | 23   | 0.00         |                    |
| 26   | 68         | 60  | 51  | 41             | 34  | 21  | 58           | 40  | 17  | 30.06                 | 29.90 | 29.79 | 20              | 10  | 7   | 15         | 6   | 23   | 0.00         |                    |
| 27   | 91         | 66  | 42  | 36             | 27  | 21  | 53           | 40  | 11  | 30.11                 | 30.06 | 30.00 | 20              | 10  | 2   | 16         | 8   | 29   | 0.00         |                    |
| 28   | 78         | 62  | 46  | 36             | 31  | 27  | 54           | 45  | 19  | 30.22                 | 30.15 | 30.08 | 20              | 11  | 7   | 13         | 7   | 23   | 0.00         |                    |
| 29   | 80         | 64  | 48  | 43             | 36  | 34  | 66           | 47  | 20  | 30.20                 | 30.16 | 30.02 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |                    |
| 30   | 82         | 66  | 51  | 46             | 36  | 32  | 54           | 44  | 17  | 29.98                 | 29.90 | 29.70 | 20              | 10  | 10  | 13         | 9   | -    | 0.00         |                    |
| 31   | 69         | 56  | 44  | 39             | 35  | 21  | 81           | 50  | 18  | 29.77                 | 29.71 | 29.67 | 10              | 10  | 10  | 17         | 7   | 23   | 0.00         |                    |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events             |
| Sep  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |                    |
| 1    | 60         | 48  | 35  | 34             | 30  | 23  | 81           | 59  | 25  | 30.26                 | 29.93 | 29.77 | 20              | 11  | 10  | 22         | 7   | 28   | 0.00         |                    |
| 2    | 62         | 48  | 33  | 32             | 26  | 21  | 75           | 55  | 22  | 30.35                 | 30.27 | 30.16 | 10              | 10  | 10  | 12         | 8   | -    | 0.00         |                    |
| 3    | 69         | 55  | 41  | 37             | 26  | 21  | 58           | 41  | 16  | 30.19                 | 30.16 | 30.08 | 10              | 10  | 10  | 15         | 7   | 29   | 0.00         |                    |
| 4    | 73         | 58  | 44  | 28             | 25  | 18  | 50           | 37  | 12  | 30.13                 | 30.09 | 29.95 | 10              | 10  | 10  | 13         | 10  | 18   | 0.00         |                    |
| 5    | 64         | 50  | 37  | 32             | 29  | 27  | 70           | 53  | 28  | 30.19                 | 30.15 | 30.11 | 10              | 10  | 10  | 12         | 5   | 17   | 0.00         |                    |
| 6    | 71         | 56  | 42  | 37             | 32  | 30  | 66           | 49  | 25  | 30.17                 | 30.10 | 30.02 | 10              | 10  | 10  | 14         | 8   | 18   | 0.00         |                    |
| 7    | 73         | 58  | 44  | 37             | 35  | 34  | 66           | 50  | 23  | 30.12                 | 30.07 | 29.98 | 10              | 10  | 10  | 12         | 9   | 23   | 0.00         |                    |
| 8    | 73         | 58  | 42  | 36             | 32  | 27  | 66           | 53  | 18  | 30.16                 | 30.12 | 29.98 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |                    |
| 9    | 78         | 62  | 46  | 34             | 26  | 19  | 50           | 35  | 13  | 29.98                 | 29.92 | 29.78 | 10              | 10  | 10  | 17         | 10  | 23   | 0.00         |                    |
| 10   | 75         | 58  | 42  | 48             | 26  | 9   | 57           | 37  | 8   | 30.05                 | 29.87 | 29.82 | 15              | 10  | 10  | 16         | 9   | 22   | 0.00         |                    |
| 11   | 66         | 54  | 41  | 37             | 27  | 25  | 62           | 42  | 24  | 30.17                 | 30.10 | 30.06 | 15              | 10  | 10  | 13         | 7   | 17   | 0.00         |                    |
| 12   | 73         | 56  | 39  | 36             | 28  | 25  | 61           | 48  | 18  | 30.11                 | 30.07 | 29.94 | 15              | 10  | 10  | 13         | 9   | -    | 0.00         |                    |
| 13   | 75         | 60  | 46  | 37             | 29  | 28  | 53           | 41  | 19  | 30.12                 | 30.05 | 30.00 | 10              | 10  | 10  | 15         | 10  | 17   | 0.00         |                    |
| 14   | 75         | 58  | 42  | 43             | 29  | 27  | 63           | 43  | 18  | 30.27                 | 30.22 | 30.17 | 20              | 10  | 10  | 13         | 9   | 17   | 0.00         |                    |
| 15   | 80         | 63  | 46  | 32             | 30  | 21  | 53           | 42  | 12  | 30.37                 | 30.32 | 30.24 | 15              | 9   | 4   | 14         | 10  | 18   | 0.00         |                    |
| 16   | 80         | 62  | 46  | 27             | 22  | 21  | 37           | 31  | 11  | 30.29                 | 30.28 | 30.21 | 10              | 10  | 10  | 14         | 10  | 21   | 0.00         |                    |
| 17   | 80         | 64  | 48  | 41             | 21  | 18  | 45           | 27  | 11  | 30.30                 | 30.19 | 30.10 | 10              | 10  | 10  | 14         | 10  | 17   | 0.00         |                    |
| 18   | 78         | 64  | 50  | 37             | 26  | 25  | 40           | 34  | 15  | 30.18                 | 30.14 | 30.11 | 10              | 10  | 10  | 15         | 10  | -    | 0.00         |                    |
| 19   | 78         | 62  | 46  | 45             | 34  | 32  | 57           | 46  | 20  | 30.18                 | 30.14 | 30.02 | 10              | 10  | 10  | 16         | 10  | 20   | 0.00         | Rain               |
| 20   | 60         | 56  | 51  | 52             | 49  | 43  | 94           | 80  | 52  | 30.11                 | 30.04 | 29.99 | 15              | 9   | 5   | 20         | 12  | 25   | 0.00         | Rain, Thunderstorm |
| 21   | 57         | 48  | 42  | 43             | 41  | 37  | 93           | 83  | 48  | 30.05                 | 30.01 | 29.99 | 20              | 11  | 10  | 13         | 5   | 17   | 0.00         | Rain               |
| 22   | 57         | 47  | 37  | 36             | 33  | 27  | 81           | 74  | 31  | 30.09                 | 30.01 | 29.98 | 10              | 10  | 10  | 17         | 8   | 25   | 0.00         |                    |
| 23   | 60         | 46  | 32  | 36             | 27  | 21  | 81           | 66  | 22  | 30.30                 | 30.23 | 30.18 | 10              | 10  | 10  | 10         | 7   | -    | 0.00         |                    |
| 24   | 71         | 54  | 37  | 37             | 26  | 23  | 65           | 51  | 16  | 30.28                 | 30.24 | 30.11 | 10              | 10  | 10  | 14         | 9   | 20   | 0.00         |                    |
| 25   | 68         | 55  | 42  | 34             | 27  | 19  | 53           | 46  | 16  | 30.15                 | 30.12 | 30.11 | 10              | 10  | 10  | 15         | 10  | 18   | 0.00         |                    |
| 26   | 73         | 56  | 39  | 28             | 25  | 16  | 57           | 43  | 12  | 30.26                 | 30.19 | 30.15 | 10              | 10  | 10  | 17         | 11  | 23   | 0.00         |                    |
| 27   | 75         | 60  | 44  | 28             | 25  | 19  | 49           | 39  | 14  | 30.23                 | 30.22 | 30.14 | 10              | 10  | 10  | 15         | 11  | 22   | 0.00         |                    |
| 28   | 73         | 56  | 42  | 28             | 25  | 21  | 53           | 41  | 14  | 30.33                 | 30.27 | 30.23 | 10              | 10  | 10  | 14         | 10  | 18   | 0.00         |                    |
| 29   | 78         | 61  | 44  | 37             | 26  | 23  | 49           | 38  | 14  | 30.37                 | 30.33 | 30.25 | 10              | 10  | 10  | 14         | 10  | 20   | 0.00         |                    |

|      |            |     |     |                |     |     |              |     |     |                       |       |       |                 |     |     |            |     |      |              |             |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|-------------|
| 30   | 78         | 62  | 46  | 39             | 29  | 27  | 50           | 38  | 16  | 30.37                 | 30.33 | 30.20 | 10              | 10  | 10  | 14         | 11  | 17   | 0.00         |             |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |
| Oct  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
| 1    | 78         | 63  | 48  | 36             | 32  | 30  | 58           | 41  | 17  | 30.33                 | 30.29 | 30.15 | 10              | 10  | 10  | 16         | 10  | 21   | 0.00         |             |
| 2    | 73         | 60  | 46  | 37             | 32  | 30  | 57           | 45  | 23  | 30.17                 | 30.11 | 29.94 | 10              | 10  | 10  | 16         | 10  | 25   | 0.00         |             |
| 3    | 62         | 51  | 42  | 43             | 37  | 36  | 76           | 68  | 42  | 29.97                 | 29.96 | 29.87 | 10              | 10  | 10  | 9          | 6   | -    | 0.00         |             |
| 4    | 55         | 50  | 44  | 46             | 44  | 41  | 100          | 87  | 58  | 29.76                 | 29.73 | 29.68 | 15              | 8   | 4   | 14         | 5   | 17   | 0.00         | Rain        |
| 5    | 53         | 44  | 35  | 37             | 33  | 23  | 93           | 77  | 33  | 30.02                 | 29.87 | 29.81 | 10              | 10  | 10  | 10         | 7   | 20   | 0.00         |             |
| 6    | 59         | 46  | 33  | 39             | 32  | 27  | 93           | 76  | 36  | 30.26                 | 30.14 | 30.07 | 10              | 10  | 10  | 13         | 7   | -    | 0.00         |             |
| 7    | 64         | 50  | 37  | 37             | 33  | 32  | 81           | 72  | 32  | 30.30                 | 30.29 | 30.18 | 10              | 10  | 10  | 12         | 8   | 18   | 0.00         |             |
| 8    | 55         | 44  | 32  | 30             | 26  | 16  | 75           | 58  | 21  | 30.23                 | 30.18 | 30.09 | 10              | 10  | 10  | 13         | 8   | -    | 0.00         |             |
| 9    | 46         | 36  | 28  | 21             | 19  | 16  | 64           | 58  | 29  | 30.04                 | 29.94 | 29.77 | 10              | 10  | 10  | 13         | 8   | 24   | 0.00         |             |
| 10   | 35         | 30  | 26  | 27             | 21  | 19  | 86           | 72  | 52  | 29.93                 | 29.83 | 29.78 | 10              | 9   | 2   | 12         | 4   | 18   | 0.00         | Snow        |
| 11   | 35         | 30  | 24  | 28             | 17  | 12  | 93           | 61  | 38  | 29.90                 | 29.81 | 29.67 | 10              | 10  | 2   | 18         | 9   | 23   | 0.00         | Snow        |
| 12   | 33         | 30  | 28  | 28             | 24  | 16  | 93           | 80  | 48  | 30.31                 | 29.98 | 29.83 | 10              | 8   | 1   | 10         | 4   | -    | 0.00         | Snow        |
| 13   | 44         | 32  | 21  | 30             | 21  | 18  | 93           | 80  | 45  | 30.48                 | 30.39 | 30.32 | 20              | 11  | 10  | 10         | 6   | -    | 0.00         |             |
| 14   | 55         | 40  | 26  | 34             | 27  | 25  | 93           | 82  | 38  | 30.47                 | 30.40 | 30.23 | 20              | 11  | 10  | 12         | 5   | 16   | 0.00         |             |
| 15   | 55         | 42  | 30  | 32             | 26  | 23  | 81           | 69  | 38  | 30.28                 | 30.24 | 30.15 | 10              | 10  | 10  | 13         | 8   | 18   | 0.00         |             |
| 16   | 60         | 46  | 33  | 36             | 24  | -27 | 75           | 60  | 4   | 30.35                 | 30.26 | 30.21 | 20              | 10  | 10  | 13         | 8   | 16   | 0.00         |             |
| 17   | 64         | 50  | 35  | 37             | 33  | 30  | 87           | 72  | 34  | 30.42                 | 30.38 | 30.26 | 10              | 10  | 10  | 14         | 9   | -    | 0.00         |             |
| 18   | 66         | 52  | 39  | 36             | 32  | 18  | 76           | 60  | 18  | 30.26                 | 30.19 | 30.07 | 10              | 10  | 10  | 14         | 10  | 17   | 0.00         |             |
| 19   | 64         | 50  | 37  | 28             | 24  | 19  | 60           | 47  | 24  | 30.22                 | 30.16 | 30.12 | 10              | 10  | 10  | 13         | 10  | 16   | 0.00         |             |
| 20   | 62         | 50  | 37  | 34             | 28  | 21  | 70           | 51  | 25  | 30.19                 | 30.13 | 30.04 | 15              | 10  | 10  | 16         | 9   | 23   | 0.00         |             |
| 21   | 48         | 42  | 37  | 28             | 16  | 0   | 70           | 37  | 13  | 30.31                 | 30.11 | 30.05 | 10              | 10  | 10  | 16         | 5   | 23   | 0.00         |             |
| 22   | 46         | 34  | 21  | 12             | 7   | 5   | 54           | 39  | 23  | 30.65                 | 30.58 | 30.50 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |             |
| 23   | 59         | 44  | 28  | 18             | 16  | 10  | 60           | 49  | 15  | 30.44                 | 30.36 | 30.17 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 24   | 55         | 42  | 30  | 21             | 16  | 14  | 55           | 45  | 22  | 30.27                 | 30.23 | 30.20 | 10              | 10  | 10  | 12         | 7   | -    | 0.00         |             |
| 25   | 69         | 51  | 33  | 34             | 21  | 18  | 65           | 49  | 20  | 30.24                 | 30.22 | 30.15 | 10              | 10  | 10  | 15         | 8   | 24   | 0.00         |             |
| 26   | 60         | 48  | 35  | 27             | 15  | 3   | 53           | 33  | 11  | 30.55                 | 30.45 | 30.37 | 10              | 10  | 10  | 16         | 10  | 21   | 0.00         |             |
| 27   | 68         | 52  | 35  | 14             | 8   | 0   | 36           | 27  | 7   | 30.52                 | 30.49 | 30.40 | 10              | 10  | 10  | 16         | 11  | 20   | 0.00         |             |
| 28   | 71         | 53  | 37  | 19             | 15  | 14  | 41           | 34  | 14  | 30.47                 | 30.45 | 30.36 | 10              | 6   | 4   | 14         | 11  | 18   | 0.00         |             |
| 29   | 66         | 50  | 39  | 25             | 23  | 19  | 56           | 35  | 17  | 30.31                 | 30.25 | 30.16 | 15              | 10  | 10  | 17         | 7   | 17   | 0.00         |             |
| 30   | 64         | 50  | 35  | 23             | 21  | 19  | 56           | 47  | 18  | 30.26                 | 30.20 | 30.17 | 15              | 10  | 10  | 15         | 11  | 20   | 0.00         |             |
| 31   | 60         | 52  | 44  | 36             | 23  | 21  | 58           | 40  | 33  | 30.33                 | 30.27 | 30.23 | 20              | 12  | 10  | 14         | 9   | -    | 0.00         |             |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |
| Nov  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
| 1    | 57         | 47  | 37  | 48             | 37  | 32  | 100          | 75  | 51  | 30.34                 | 30.24 | 30.00 | 20              | 11  | 2   | 10         | 7   | -    | 0.00         | Rain        |
| 2    | 50         | 46  | 44  | 48             | 45  | 37  | 100          | 94  | 62  | 30.01                 | 29.92 | 29.84 | 20              | 9   | 2   | 9          | 3   | -    | 0.00         | Rain        |
| 3    | 39         | 34  | 32  | 36             | 33  | 30  | 100          | 92  | 81  | 30.02                 | 30.00 | 29.95 | 20              | 11  | 10  | 7          | 2   | -    | 0.00         |             |
| 4    | 37         | 34  | 32  | 36             | 33  | 28  | 100          | 94  | 75  | 29.69                 | 29.64 | 29.60 | 15              | 5   | 0   | 12         | 2   | 20   | 0.00         | Rain , Snow |
| 5    | 37         | 30  | 23  | 19             | 17  | 10  | 80           | 66  | 33  | 30.16                 | 29.97 | 29.87 | 10              | 10  | 10  | 10         | 5   | -    | 0.00         |             |
| 6    | 39         | 30  | 21  | 27             | 14  | 12  | 68           | 65  | 41  | 30.41                 | 30.31 | 30.26 | 10              | 10  | 10  | 16         | 12  | 17   | 0.00         |             |
| 7    | 39         | 30  | 28  | 30             | 26  | 25  | 93           | 87  | 70  | 30.42                 | 30.41 | 30.38 | 10              | 10  | 10  | 8          | 5   | -    | 0.00         |             |
| 8    | 51         | 42  | 33  | 39             | 32  | 32  | 93           | 86  | 58  | 30.27                 | 30.21 | 30.03 | 15              | 10  | 10  | 9          | 7   | -    | 0.00         |             |
| 9    | 41         | 38  | 37  | 37             | 35  | 34  | 93           | 86  | 81  | 29.85                 | 29.79 | 29.75 | 15              | 10  | 5   | 8          | 6   | -    | 0.00         | Rain        |
| 10   | 44         | 40  | 37  | 39             | 36  | 36  | 93           | 89  | 71  | 29.90                 | 29.80 | 29.76 | 20              | 11  | 10  | 9          | 5   | -    | 0.00         |             |
| 11   | 35         | 32  | 28  | 34             | 27  | 25  | 93           | 84  | 75  | 30.11                 | 30.06 | 30.02 | 10              | 10  | 5   | 9          | 6   | -    | 0.00         | Snow        |
| 12   | 57         | 40  | 30  | 43             | 31  | 28  | 100          | 92  | 44  | 30.14                 | 30.13 | 30.05 | 20              | 10  | 1   | 15         | 3   | 23   | 0.00         |             |
| 13   | 55         | 50  | 39  | 41             | 33  | 7   | 81           | 62  | 16  | 30.08                 | 29.98 | 29.94 | 20              | 10  | 10  | 17         | 6   | 25   | 0.00         |             |

|      | 35         | 30  | 24  | 19             | 16  | 12  | 69           | 57  | 47  | 30.50                 | 30.29 | 30.18 | 10              | 10  | 10  | 9          | 4   | -    | 0.00         |             |
|------|------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-----------------------|-------|-------|-----------------|-----|-----|------------|-----|------|--------------|-------------|
| 15   | 44         | 33  | 24  | 28             | 22  | 21  | 86           | 75  | 49  | 30.58                 | 30.56 | 30.50 | 10              | 10  | 10  | 10         | 6   | -    | 0.00         |             |
| 16   | 48         | 38  | 28  | 28             | 27  | 25  | 87           | 78  | 43  | 30.42                 | 30.39 | 30.35 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 17   | 46         | 34  | 30  | 27             | 24  | 19  | 80           | 68  | 37  | 30.49                 | 30.46 | 30.45 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 18   | 59         | 47  | 35  | 28             | 23  | 21  | 60           | 52  | 29  | 30.42                 | 30.37 | 30.25 | 10              | 10  | 10  | 14         | 11  | 20   | 0.00         |             |
| 19   | 48         | 37  | 33  | 25             | 22  | 21  | 65           | 58  | 34  | 30.29                 | 30.27 | 30.26 | 10              | 10  | 10  | 15         | 11  | 18   | 0.00         |             |
| 20   | 55         | 45  | 35  | 28             | 27  | 25  | 75           | 65  | 31  | 30.28                 | 30.24 | 30.10 | 10              | 10  | 10  | 14         | 8   | 17   | 0.00         |             |
| 21   | 39         | 32  | 26  | 21             | 18  | 14  | 74           | 55  | 36  | 30.31                 | 30.21 | 30.16 | 10              | 10  | 10  | 16         | 7   | 26   | 0.00         |             |
| 22   | 42         | 33  | 24  | 28             | 18  | 12  | 75           | 62  | 29  | 30.22                 | 30.16 | 30.06 | 20              | 11  | 10  | 12         | 8   | -    | 0.00         |             |
| 23   | 32         | 26  | 23  | 30             | 23  | 18  | 100          | 85  | 55  | 30.34                 | 30.19 | 30.14 | 10              | 10  | 10  | 10         | 4   | -    | 0.00         | Fog         |
| 24   | 44         | 34  | 24  | 19             | 16  | 10  | 74           | 65  | 25  | 30.39                 | 30.38 | 30.25 | 10              | 10  | 10  | 17         | 10  | 21   | 0.00         |             |
| 25   | 50         | 39  | 28  | 21             | 15  | 14  | 59           | 53  | 29  | 30.29                 | 30.24 | 30.13 | 10              | 10  | 10  | 16         | 11  | 22   | 0.00         |             |
| 26   | 41         | 32  | 30  | 21             | 19  | 19  | 64           | 59  | 42  | 30.16                 | 30.13 | 30.12 | 10              | 10  | 10  | 13         | 10  | 17   | 0.00         |             |
| 27   | 51         | 42  | 32  | 27             | 19  | 18  | 60           | 53  | 28  | 30.11                 | 30.07 | 29.99 | 15              | 10  | 10  | 13         | 9   | 17   | 0.00         |             |
| 28   | 44         | 36  | 28  | 27             | 25  | 21  | 86           | 73  | 49  | 30.17                 | 30.09 | 30.04 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 29   | 53         | 37  | 26  | 36             | 25  | 23  | 86           | 81  | 51  | 30.23                 | 30.17 | 30.14 | 10              | 10  | 10  | 8          | 3   | -    | 0.00         |             |
| 30   | 53         | 40  | 26  | 37             | 29  | 25  | 93           | 85  | 50  | 30.31                 | 30.27 | 30.23 | 10              | 10  | 10  | 9          | 5   | -    | 0.00         |             |
| 2008 | Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Press. (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     |      | Precip. (in) | Events      |
| Dec  | high       | avg | low | high           | avg | low | high         | avg | low | high                  | avg   | low   | high            | avg | low | high       | avg | high | sum          |             |
| 1    | 48         | 39  | 30  | 36             | 27  | 23  | 81           | 71  | 49  | 30.27                 | 30.20 | 30.03 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 2    | 48         | 36  | 30  | 34             | 27  | 27  | 87           | 78  | 43  | 29.99                 | 29.91 | 29.83 | 15              | 11  | 10  | 9          | 6   | -    | 0.00         |             |
| 3    | 39         | 32  | 24  | 27             | 20  | 18  | 80           | 70  | 52  | 30.20                 | 30.15 | 30.11 | 10              | 10  | 10  | 12         | 4   | -    | 0.00         |             |
| 4    | 33         | 28  | 24  | 28             | 23  | 16  | 93           | 74  | 51  | 30.30                 | 30.17 | 30.11 | 10              | 10  | 10  | 10         | 4   | -    | 0.00         |             |
| 5    | 33         | 25  | 17  | 21             | 14  | 12  | 80           | 76  | 60  | 30.39                 | 30.35 | 30.30 | 15              | 10  | 10  | 9          | 7   | -    | 0.00         |             |
| 6    | 42         | 32  | 21  | 21             | 20  | 18  | 93           | 77  | 39  | 30.35                 | 30.32 | 30.24 | 20              | 10  | 10  | 9          | 5   | -    | 0.00         |             |
| 7    | 32         | 28  | 24  | 23             | 21  | 18  | 80           | 72  | 60  | 30.17                 | 30.13 | 30.04 | 10              | 10  | 10  | 8          | 6   | -    | 0.00         |             |
| 8    | 37         | 32  | 26  | 28             | 25  | 18  | 93           | 82  | 48  | 29.81                 | 29.77 | 29.75 | 20              | 11  | 10  | 13         | 6   | -    | 0.00         |             |
| 9    | 30         | 24  | 17  | 19             | 10  | 7   | 74           | 58  | 43  | 30.38                 | 30.25 | 30.15 | 10              | 10  | 10  | 12         | 8   | -    | 0.00         |             |
| 10   | 39         | 30  | 21  | 21             | 20  | 18  | 86           | 72  | 45  | 30.50                 | 30.43 | 30.41 | 10              | 10  | 10  | 8          | 3   | -    | 0.00         |             |
| 11   | 39         | 29  | 19  | 27             | 17  | 16  | 86           | 79  | 49  | 30.47                 | 30.39 | 30.30 | 10              | 10  | 10  | 10         | 8   | -    | 0.00         |             |
| 12   | 39         | 29  | 19  | 30             | 21  | 16  | 100          | 69  | 44  | 30.18                 | 29.94 | 29.38 | 15              | 9   | 1   | 12         | 7   | -    | 0.00         | Snow        |
| 13   | 32         | 26  | 17  | 32             | 20  | 5   | 100          | 74  | 40  | 29.45                 | 29.25 | 29.16 | 20              | 10  | 1   | 20         | 8   | 24   | 0.00         | Snow        |
| 14   | 15         | 12  | 8   | 10             | 4   | 1   | 85           | 75  | 73  | 29.73                 | 29.60 | 29.54 | 10              | 9   | 2   | 8          | 5   | -    | 0.00         | Snow        |
| 15   | 19         | 14  | 10  | 18             | 11  | 7   | 93           | 85  | 73  | 29.80                 | 29.78 | 29.72 | 15              | 8   | 0   | 6          | 2   | -    | 0.00         | Snow        |
| 16   | 21         | 16  | 10  | 18             | 10  | 3   | 93           | 81  | 58  | 29.93                 | 29.77 | 29.70 | 20              | 9   | 0   | 18         | 7   | 20   | 0.00         | Fog , Snow  |
| 17   | 12         | 5   | -2  | 10             | 0   | -6  | 92           | 85  | 72  | 29.98                 | 29.96 | 29.94 | 10              | 10  | 5   | 9          | 6   | -    | 0.00         |             |
| 18   | 23         | 18  | 12  | 19             | 10  | 7   | 100          | 79  | 50  | 29.84                 | 29.77 | 29.72 | 20              | 9   | 0   | 12         | 8   | -    | 0.00         | Snow        |
| 19   | 23         | 12  | 0   | 19             | 10  | -6  | 100          | 80  | 39  | 29.99                 | 29.76 | 29.66 | 15              | 7   | 0   | 13         | 3   | 21   | 0.00         | Snow        |
| 20   | 19         | 8   | -4  | 5              | -3  | -9  | 85           | 73  | 49  | 30.24                 | 30.07 | 30.00 | 15              | 10  | 10  | 12         | 8   | -    | 0.00         |             |
| 21   | 23         | 14  | 6   | 19             | 6   | -2  | 93           | 77  | 62  | 30.25                 | 30.16 | 29.90 | 10              | 5   | 1   | 13         | 8   | -    | 0.00         | Snow        |
| 22   | 30         | 19  | 8   | 25             | 19  | 3   | 100          | 88  | 47  | 29.62                 | 29.49 | 29.35 | 20              | 4   | 0   | 8          | 2   | -    | 0.00         | Snow        |
| 23   | 17         | 12  | 6   | 5              | 3   | 0   | 79           | 71  | 53  | 29.73                 | 29.57 | 29.53 | 10              | 10  | 10  | 17         | 10  | 10   | 0.00         |             |
| 24   | 10         | 4   | 0   | 3              | -4  | -6  | 78           | 74  | 66  | 29.91                 | 29.88 | 29.87 | 15              | 10  | 10  | 13         | 10  | -    | 0.00         |             |
| 25   | 26         | 22  | 19  | 25             | 17  | 5   | 100          | 85  | 46  | 29.53                 | 29.38 | 29.24 | 10              | 3   | 0   | 10         | 5   | -    | 0.00         | Snow        |
| 26   | 21         | 14  | 6   | 5              | 1   | -2  | 72           | 52  | 39  | 30.03                 | 29.65 | 29.41 | 15              | 10  | 10  | 16         | 12  | 23   | 0.00         |             |
| 27   | 19         | 10  | 1   | 18             | 4   | -6  | 93           | 76  | 62  | 30.14                 | 30.06 | 30.01 | 10              | 7   | 1   | 14         | 8   | -    | 0.00         | Snow        |
| 28   | 28         | 22  | 17  | 27             | 20  | 14  | 93           | 90  | 86  | 30.20                 | 30.14 | 30.12 | 10              | 4   | 0   | 8          | 5   | -    | 0.00         | Snow        |
| 29   | 41         | 34  | 28  | 34             | 28  | 21  | 100          | 83  | 52  | 30.18                 | 30.07 | 29.93 | 20              | 8   | 0   | 20         | 5   | 31   | 0.00         | Rain , Snow |
| 30   | 35         | 25  | 15  | 21             | 11  | 3   | 73           | 53  | 34  | 30.30                 | 30.19 | 30.11 | 10              | 10  | 10  | 16         | 8   | 31   | 0.00         |             |

[Show full METARS](#) | [METAR FAQ](#) | [Comma Delimited File](#)**Local Weather**[My Locations](#)  
[History Data](#)  
[Weather Stations](#)**Maps & Radar**[Radar](#)  
[Satellite](#)  
[WunderMap™](#)**Severe Weather**[Tropical & Hurricane](#)  
[Storm Reports](#)  
[U.S. Severe Alerts](#)**Photos & Video**[Photo Galleries](#)  
[World View](#)  
[Webcams](#)**Blogs**[Dr. Jeff Masters](#)  
[Meteorology Blogs](#)  
[Member Blogs](#)**Travel & Activities**[Ski & Snow](#)  
[Sports](#)  
[Road Trip Planner](#)**Resources**[Severe Weather](#)  
[Climate Change](#)  
[About Maps & Radar](#)**Get Free Weather Stickers®****Upload Your Photos****Start a WunderBlog****Become a Site Member****Find us on Facebook****Follow us on Twitter****Custom Weather Services**

In addition to this website, we provide a number of free and professional weather services.

**Website Autobrand®**[Newspapers](#)  
[Weather Stickers®](#)  
[API / XML Feeds](#)  
[About Our Data](#)**Advertise On This Site**

Weather Underground has extensive targeting capabilities to fulfill all of your client's advertising needs.

[Advertising Information](#)  
[Media Kit \(PDF\)](#)

|                   |                 |         |               |
|-------------------|-----------------|---------|---------------|
| Post-it® Fax Note | 7671            | Date    | # of pages 12 |
| To                | Cindy Zimmerman | From    | Allen Merritt |
| Co/Dept.          |                 | Co.     |               |
| Phone #           |                 | Phone # |               |
| Fax #             |                 | Fax #   |               |

MEMO

TO: Terry Blau  
FROM: Rick Sterling *RS*  
SUBJECT: Estimating annual water requirements for geothermal heating  
DATE: March 25, 1988

I have come up with a procedure for estimating annual water requirements for geothermal heating that I hope will give reasonably accurate results, yet still be fairly simple to use. Note that the method was developed for predicting residential energy use; consequently, applying it to anything else greatly increases the margin for error. Also note that an underlying assumption in using this procedure is that the heating system in question has an adequate means of adjusting flow rates. The procedure is outlined below in a step-by-step format. Necessary graphs and tables of data are attached.

- Step 1 - Estimate the peak heating requirement per square foot of floor area using the attached graph. Select the design temperature difference along the x-axis, which is the desired indoor temperature minus the design outdoor temperature. Design outdoor temperatures are given for several Idaho locations on the attached table "Climatic Conditions for the United States."
- Step 2 - Multiply the peak heating requirement per square foot of floor area by the dimensions of the building to be heated to obtain a peak heating load in BTU/hr.
- Step 3 - Apply the equation shown below to estimate annual water requirements.

1

MICROFILMED  
APR 22 2003

SCANNED  
11/11/06

$$V = \frac{HL * DD * 24 * C_D}{\Delta t_1 * k * C \Delta t_2}$$

Where

V= annual volume of geothermal water required

HL= peak heating load in BTU/hr

DD= annual heating degree days (see attached table)

24= 24 hrs/day

$C_D$ = empirical correction factor for heating effect vs. 65 F degree days

Use 0.85 (conservative) for greenhouses - Geo-Heat center research indicates  $C_D$  varies from 0.70 to 0.82 for greenhouses.

For standard construction, choose  $C_D$  from ASHRAE Figure 1 (attached).

$\Delta t_1$ = design temperature difference, i.e., desired indoor temperature minus design outdoor temperature (same as for determining peak heating requirement)

k= correction factor to account for losses in system which do not contribute to space heating of structure, i.e., system efficiency. Use 0.90.

C= constant to correct for desired units

for V in acre-ft use  $C = 2.72 \times 10^6$  BTU/AF-°F

for V in gallons use  $C = 8.33$  BTU/gal-°F

for V in ft<sup>3</sup> use  $C = 62.4$  BTU/ft<sup>3</sup>-°F

$\Delta t_2$ = temperature of incoming geothermal water minus temperature of outgoing geothermal water in degrees F.

Example -

\*Glass greenhouse located in Twin Falls

\*Design indoor temperature = 60 °F

\*Greenhouse dimensions are 100 x 120

$$V = \frac{HL * DD * 24 * C_D}{\Delta t_1 * k * C \Delta t_2}$$

Where

V= annual volume of ge

HL= peak heating load

DD= annual heating deg

24= 24 hrs/day

$C_D$ = empirical correction factor for heating correct vs.  
65 F degree days

Use 0.85 (conservative) for greenhouses - Geo-Heat  
center research indicates  $C_D$  varies from 0.70 to 0.82  
for greenhouses.

For standard construction, choose  $C_D$  from ASHRAE  
Figure 1 (attached).

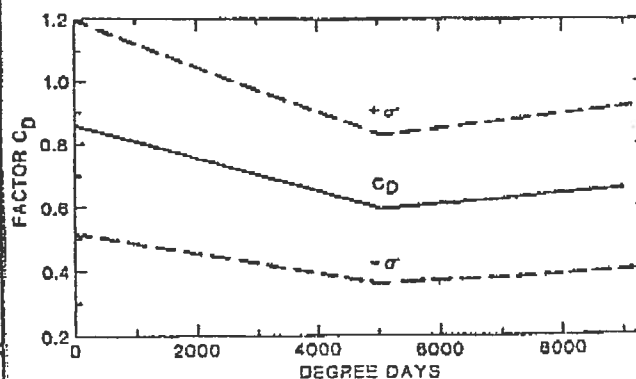


Fig. 1 Correction Factor  $C_D$  vs. Degree-Days

$\Delta t_1$ = design temperature difference, i.e., desired indoor  
temperature minus design outdoor temperature (same as  
for determining peak heating requirement)

k= correction factor to account for losses in system  
which do not contribute to space heating of structure,  
i.e., system efficiency. Use 0.90.

C= constant to correct for desired units

for V in acre-ft use  $C = 2.72 \times 10^6$  BTU/AF-°F

for V in gallons use  $C = 8.33$  BTU/gal-°F

for V in ft<sup>3</sup> use  $C = 62.4$  BTU/ft<sup>3</sup>-°F

$\Delta t_2$ = temperature of incoming geothermal water minus  
temperature of outgoing geothermal water in degrees F.

Example -

\*Glass greenhouse located in Twin Falls

\*Design indoor temperature = 60 °F

\*Greenhouse dimensions are 100 x 120

\*Geothermal supply water temp = 140° F

\*Geothermal water exit temp = 105° F ( $\Delta t = 35^\circ$  F)

Inside minus outside temp =  $60 - (-3) = 63^\circ$  F

Peak heat required = 137 BTU/hr-ft<sup>2</sup>

Peak heat load =  $137 * 100 * 120 = 1,644,000$  BTU/hr

Heating degree days = 6146

$\Delta t_1 = 63^\circ$  F

k = 0.90

C =  $2.72 \times 10^6$

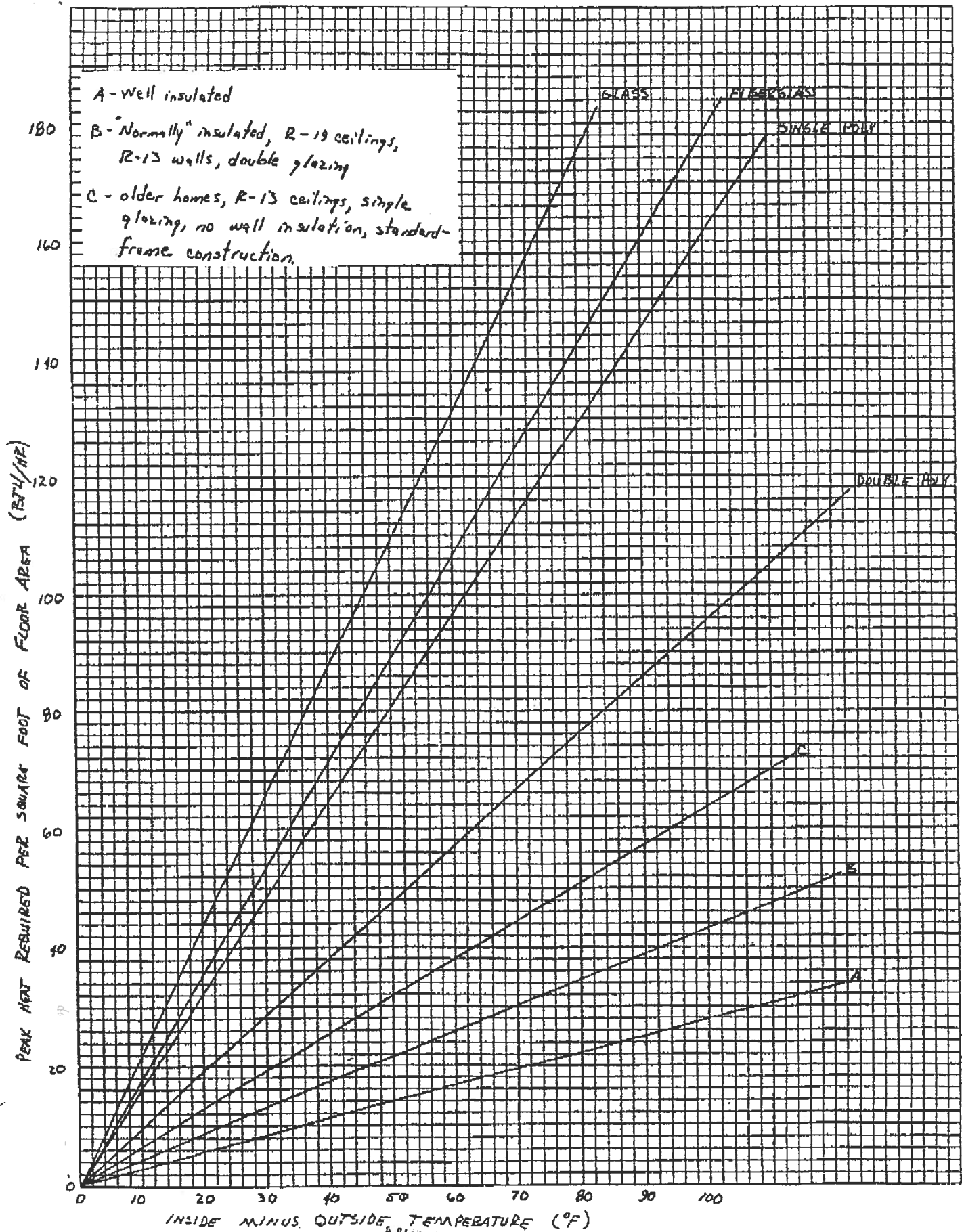
$\Delta t_2 = 140 - 105 = 35^\circ$  F

$$V = \frac{(1644000)(6146)(24)(0.85)}{(63)(0.90)(2.72 \times 10^6)(35)}$$

$$= 38.2 \text{ AF/yr}$$

(NOTE: the larger  $\Delta t_2$  gets, the smaller V gets, i.e., big  $\Delta t_2$ 's require less water.)

Call me if you have any questions.



MICROFILMED

APR 22 2003

SCANNED

JUL 11 2006

## 23.2

## CHAPTER 23

## 1985 Fundamentals Handbook

Often energy calculations lead to an economic analysis to establish cost effectiveness of conservation measures. Thus, thorough energy analysis provides intermediate data, such as time of energy usage and maximum demand, so that utility charges can be accurately estimated. Although not actually part of the energy calculations, it is necessary to estimate capital equipment costs to complete this process. This is often done in conjunction with the energy analysis.

## Methods Available

The sophistication of the calculation procedure can often be inferred from the number of separate ambient conditions and/or time increments used in the calculations. Thus, a simple procedure may use only one measure, such as annual degree days, and will be appropriate only for simple systems and applications. In this case, these methods are called *single-measure methods*. Accuracy can be improved by using more information, such as the number of hours anticipated under particular operating conditions. These methods, of which the *bin method* is best known, are referred to as *simplified multiple-measure methods*. The most elaborate methods perform energy balance calculations hourly over a given analysis period, typically one year. These are called *detailed simulation methods*. There are a number of variations. These methods require hourly weather data, as well as hourly estimates of internal loads such as lighting and occupants. Although not widely accepted as necessary, some calculations are made over shorter time intervals.

The tendency in the literature to classify methods of energy calculations as either "hand calculation" or "computer" methods are no longer appropriate, since even the simplest methods today are programmed for computer or programmable calculator solution.

The growing importance of solar heating and/or cooling of buildings requires that methods for energy analysis be available to the engineer or designer. Solar systems differ from conventional systems primarily in that they require mathematical models of solar collectors and other specialized components. Also, assumptions that are suitable for analysis in conventional systems may not be applicable to solar systems, because of the greater sensitivity of solar systems to climate variation. Therefore, this chapter includes a separate section on the analysis of active and passive solar heating and cooling systems.

## PART I: SINGLE MEASURE METHODS

While the single measure methods described in this section generally apply only to residences, the equivalent full-load hour technique for estimating cooling is also used in light commercial applications.

Records of past energy requirements and/or fuel consumption for a particular residence are the best basis for estimating future energy use. However, in the absence of past records for a particular residence, the data from similar local dwellings can be used, but with caution. Living habits vary greatly and identical residences can have very different energy use patterns. Averages taken from many types of plants in many types of residences in various localities can be inaccurate when applied to a particular residence. Therefore, it is often necessary to estimate energy consumption from computed heating and/or cooling loads.

In preparing energy estimates, it is important to know that any estimating method produces a more reliable result over a long period of operation than over a short period. Nearly all of the methods used give reasonable results over a full annual heating season, but estimates for shorter periods, such as a

month, can produce inaccurate results. As the estimation period is shortened, there is more chance that some factor not taken directly into account in the estimating method will deviate from its long-term average value, causing an error in the predicted energy requirement.

Single-measure methods can be divided into those applicable to estimating heating energy requirements and cooling energy requirements. Generally, heating methods have existed longer and are more refined than cooling methods.

## HEATING ENERGY

The traditional degree day procedure for estimating heating energy requirements is based on the assumption that, on a long-term average, solar and internal gains will offset heat loss when the mean daily outdoor temperature is 65 F or higher and that fuel consumption will be proportional to the difference between the mean daily temperature and 65 F. In other words, on a day when the mean temperature is 20 deg F below 65 F, twice as much fuel is consumed as on days when the mean temperature is 10 deg F below 65 F. This basic concept can be represented in an equation stating that energy consumption is directly proportional to the number of degree days in the estimation period. The equation has undergone several stages of refinement<sup>1-4</sup> in an attempt to make it agree as closely as possible with the available measured data on an average basis. The currently recommended form is:

$$E = \frac{H_L \cdot D \cdot 24}{\Delta t \cdot k \cdot V} (C_D) \quad (1)$$

where

- $E$  = fuel or energy consumption for the estimate period, Btu.
- $H_L$  = design heat loss, including infiltration and ventilation, Btu/h.
- $D$  = number of 65 F degree days for the estimate period.
- $\Delta t$  = design temperature difference, deg F.
- $k$  = a correction factor that includes the effects of rated full load efficiency, part load performance, oversizing and energy conservation devices.
- $V$  = heating value of fuel, units consistent with  $H_L$  and  $E$ .
- $C_D$  = empirical correction factor for heating effect vs. 65 F degree days.

Although empirical, this equation has some basis in physical fact. In an approximate sense,  $H_L / \Delta t$  can be thought of as an overall inside-to-outside thermal conductance ( $UA$ ) for the building. In a similar sense, the  $D$  can be thought of as the inside-to-outside temperature difference averaged over the day, so that the product yields the daily heating load. Division by the fuel heating value yields the ideal amount of fuel required for the day. The constant is for unit conversion, i.e., 24 h/d. The factors  $k$  and  $C_D$  are empirical and attempt to account for the various effects noted in their definitions.

Values of heating load  $H_L$  must be determined for the residence for which the estimate is being made. It must account for size, building materials, architectural features, use and climatic conditions. Generally, the peak design heating load is used. This is normally calculated without consideration to solar and internal gains to reflect the peak heating requirement. Although the transmission loss is independent of the type of heating system, duct or pipe losses and air infiltration losses are not. Thus, the design heat loss should include duct or pipe losses to unconditioned spaces, reflecting the average warm air, water or steam temperature, and should reflect the additional air infiltration resulting from a stack in or adjacent to the conditioned space. Recent work<sup>5,6</sup> suggests infiltration increases about 20% in fuel-heated homes without sealed combustion systems. Reeves, *et al.*<sup>7</sup> suggest an increase

MICRO  
APR 22 2003

SCANNED

JUL 17 1996

## Energy Estimating Methods

28.3

of 12.5% when an unsealed combustion system is in an unconditioned space such as a basement. This factor is important because it accounts for a significant portion of the annual heat loss. Typical values of residential infiltration are 0.5 to 0.75 air changes per hour for noncombustion systems and combustion systems that do not draw from the conditioned space, and 0.5 to 1.0 air changes per hour for other combustion heating systems.

Degree day values are calculated from monthly mean temperature statistics for the 30-y long-term period 1941-1970 using a procedure developed by H.C.S. Thom.<sup>9,9</sup> The statistics are the monthly means and the standard deviation of the means around the 30-y normal. Degree days are not accumulated from the period of record on a day-by-day basis. The U.S. Weather Bureau, National Climatic Center, has published degree days to base 65 F, and to a wide range of other base temperatures.<sup>10</sup> Degree days for Canadian cities were supplied by the Canadian Climatic Centre, Atmospheric Environmental Service, 4905 Dufferin St., Downsview, Ontario, Canada M3H 5T4, and were computed from mean temperature normals on record for various stations.

Studies made by the American Gas Association before 1932,<sup>11</sup> and by the National District Heating Association in 1932,<sup>12</sup> indicated that 65 F was an appropriate base. However, residential insulation practices have improved from virtually none in 1930 to R-11 in walls and R-30 in ceilings today.

Internal gains also have increased dramatically. Edison Electric Institute reports<sup>13</sup> show average residential electric usage of 675 kWh per month in 1973 versus 46 kWh in 1930. Recent research indicates that monthly average internal and solar gains are sufficient to offset a home's heat loss at mean daily temperature below 65 F. This suggests that the degree day procedure might be developed in the future to consider the use and effect of lower base temperatures. This is discussed later (see Variable Base Degree Day Method).

The errors inherent in the established 65 F-based method can be adjusted by using an empirical factor  $C_D$ . Figure 1 gives available values for  $C_D$ . These values are calculated using typical modern single-family construction (ASHRAE Standard 90-1980), and generally agree with electric utility experience. Local estimates of  $C_D$  values may be available from the energy supplier and would be more applicable to a specific site, since this value is highly variable. The dashed lines on the figure indicate  $\pm$  one standard deviation, based on EPRI tests in the Denver area.<sup>14</sup> An Edison Electric Institute study of low income apartments recommended a  $C_D$  of approximately 0.5.<sup>15</sup>

The correction factor  $k$  is empirical, for use in Eq. (1), and should not be confused with any ratings for "seasonal efficiency," such as the DOE tests. For electric resistance

heating, a value of 1.0 should be used. For fossil fuels, analysis of 140 gas-heated homes<sup>3</sup> participating in the AGA "Space Heating System Efficiency Improvement Program" using Eq. (1) and Fig. 1 yielded a mean value of 0.55 with a standard deviation of 0.22.<sup>3</sup> While a  $k$  value of 0.55 is indicated for the group of homes in this program, there are other indications that a somewhat higher value of 0.65 is appropriate for newer homes with energy conservation features. Other values of  $k$  for gas heating systems are available from the AGA. The National Oil Jobbers Council has values for oil-heating systems and the Edison Electric Institute has information about electrical heating systems. Variations because of oversizing and conservation techniques are reported in Ref. 16 and the references in the Energy Conservation Effects section of this chapter.

## Estimating Oil or Gas Consumption

Equation 1 is applicable to estimates of oil or gas consumption.

**Example 1:** Estimate the annual gas consumption for a residence with a design heat loss of 65,730 Btu/h at 0 F outdoor and 70 F indoor design temperatures. The home is in an area where the heating season averages 5610 F degree days and natural gas is sold by the therm—100,000 Btu/therm. A 100,000 Btu/h (input) furnace is planned.

**Solution:** Fig. 1 indicates a heating correction factor  $C_D$  of 0.60 in the 4000 to 7000 degree day range.

a. With a fully-condensing boiler, assume that  $k$  is 0.90:

$$E = \frac{65,730 \cdot 5610 \cdot 24}{70 \cdot 0.90 \cdot 100,000} (0.6) = 842 \text{ therms}$$

b. With an induced draft, spark-ignition forced air furnace, assume a  $k$  of 0.80:

$$E = \frac{65,730 \cdot 5610 \cdot 24}{70 \cdot 0.80 \cdot 100,000} (0.6) = 948 \text{ therms}$$

c. With a good quality, conventional, atmospherically-vented furnace, assume a  $k$  of 0.60:

$$E = \frac{65,730 \cdot 5610 \cdot 24}{70 \cdot 0.60 \cdot 100,000} (0.6) = 1264 \text{ therms}$$

**Example 2:** Estimate the seasonal oil consumption of a boiler designed for oil firing in a new, energy-efficient residence located in Toledo, Ohio. The residence has a calculated heat loss of 65,500 Btu/h. The oil heat value is 144,000 Btu/gal. The outdoor design temperature for Toledo is -10 F; indoor design temperature is 70 F.

**Solution:** Toledo has a normal annual degree day rating of 6494 F. Since the building is new and "energy efficient," including efficient oil burners and so forth, use  $k = 0.65$ . From Eq. (1):

$$E = \frac{65,500 \cdot 6494 \cdot 24}{80 \cdot 0.65 \cdot 144,000} (0.60) = 818 \text{ gal}$$

## Estimating Electrical Energy

These procedures apply only to resistance-type heating devices such as baseboard, electric furnaces and electric boilers. Equation (1) has been used for heat pumps by adding a "seasonal performance factor," but estimating this factor, without comparable building data, is hazardous. The bin method calculation presented later is recommended for heat pumps. For other electric heat systems, Eq. (1) applies.

**Example 3:** Estimate the energy requirements to heat a residence in Atlanta. The design heat loss is 35,000 Btu/h based on 15 F outdoor and 70 F indoor.

**Solution:** From Eq. (1):

$$E = \frac{35,000 \cdot 2961 \cdot 24}{55 \cdot 1.0 \cdot 3413} (0.79) = 10,468 \text{ kWh}$$

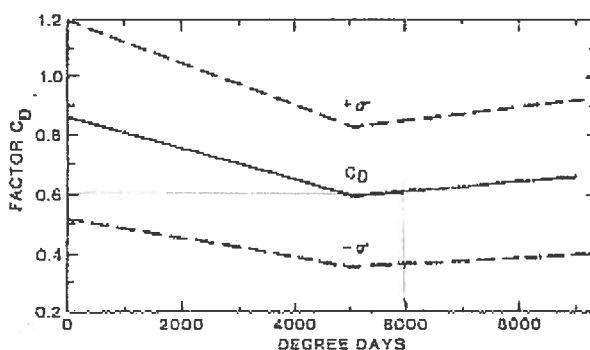


Fig. 1 Correction Factor  $C_D$  vs. Degree-Days

SCANNED

## 28.4

## CHAPTER 28

## 1985 Fundamentals Handbook

## Degree Day Method

The simplicity of the above procedure is attractive, but certain facts must be understood to interpret the results.

Several organizations, including the National Bureau of Standards, the Electric Power Research Institute, the Institute of Gas Technology and ASHRAE are developing more valid, simplified procedures, but use of the degree day procedure probably will continue because it is easy to use and allows for quick estimates. It is important to remember that the wide variations in occupant living habits and the assumptions inherent in this procedure can result in large variations from actual fuel use on an annual basis. A study of 46 homes across the U.S. indicated that individual houses experience differences of 30 to 40% for heating.<sup>17</sup> The entire sample of 46 homes had a total error of less than 7%.

Any method of estimating energy use based primarily on calculating heat losses or gains must also take into account the efficiency with which the energy is used. For estimating purposes, the efficiency of energy usage over the calculation period has been used. This is distinct from heating unit efficiency which expresses the heat delivered by a furnace or boiler as a percentage of the heat provided in the fuel; it is the efficiency normally used in describing the performance of a unit under rated or stated load conditions.

On one hand, a University of Illinois study<sup>18</sup> showed that in a two-story residence with an inside chimney, as much as 35% of the heat delivered to the chimney, which would normally be considered a loss so far as heating unit efficiency is concerned, can be delivered to the house through the heated chimney walls. Much of this recovered heat may be available for heating. On the other hand, the same study showed that at times only about 50% of the heating requirement was supplied directly by the heating unit. People, lighting, appliance use and solar gains all contribute substantially. As insulation standards have improved and appliance and lighting use have increased, even larger percentages of the heating requirement are provided by such internal sources. This results in frequent operation at part load and, consequently, at lower than design efficiency.<sup>19</sup>

The utilization efficiency can vary widely even in similar residences in the same area. A fixed value could be misleading because of many factors affecting it. A system's efficiency depends on the operation of the equipment, the control arrangement and human habits. The location of the heating unit and the chimney and the net effect of infiltration often are important in determining the efficiency of utilization for heating. Efficiency also can vary with the time of year because the average load on the furnace varies. Some reasons for this have been demonstrated in intermittently fired oil furnaces.<sup>20</sup> In buildings other than residences, the efficiency of utilization of the heat supplied in the fuel also can vary widely.

## THE VARIABLE BASE DEGREE DAY METHOD

## Overview

The variable base degree day (VBDD) method<sup>21-26</sup> is a generalization of the widely used degree day method. It retains the familiar degree day concept, but counts degree days based on the *balance point temperature*, defined as the average outdoor temperature at which the building requires neither heating nor cooling. (Note that this balance temperature is not related to the balance temperature used in heat pump performance modeling). The use of the method for calculating heating fuel requirements is described in this section, but variations on the method have also been used for cooling calculations.<sup>21,24,26</sup>

The degree-day procedure is intended to recognize that, although the energy transferred out of a building is proportional to the difference between interior space temperature and the outside temperature, the heating equipment needs to meet only the part not covered by "free heat" from internal sources such as lights, equipment, occupants and solar gain. In other words, the free heat covers energy requirements down to the *balance point temperature*, below which the energy requirements of the space are proportional to the difference between the balance point temperature and the outside temperature.

The balance temperature  $T_b$  for a building depends on indoor temperature, thermal properties the heat gains from appliances, sun and any other sources not related to the space conditioning system. The steady-state heating requirements of a building  $Q_H$  can be expressed as:

$$Q_H = BLC(T_i - T_o) - Q_s \quad (2)$$

where

BLC = building loss coefficient, Btu/h · F

$T_i$  = indoor temperature, F

$T_o$  = outdoor temperature, F

$Q_s$  = all space heat gains not attributed to the space conditioning system, Btu/h

The balance temperature is determined by setting  $Q_H = 0$  and solving Eq. (2) for  $T_o = T_b$ , so:

$$T_b = T_i - Q_s/BLC \quad (3)$$

While Eq. (2) and (3) are strictly true only for steady-state conditions, the variable base degree day method assumes that these equations can be used for analysis if all quantities are replaced by appropriate average values for the period analyzed, typically ranging from a month to a heating season.

Once the balance temperature is determined, the energy consumption can be calculated as:

$$E_H = \frac{24 \cdot BLC \cdot DD_{T_b}}{k} \quad (4)$$

where

$DD_{T_b}$  = degree days calculated to the base temperature  $T_b$

$k$  = a correction factor that includes the effects of rated full load efficiency, part load performance, oversizing and energy conservation devices

There is considerable flexibility inherent in the VBDD concept since  $E_H$  can be calculated for periods as short as a few days and as long as a season. If  $E_{HT}$  is calculated for less than an entire season, then the total seasonal requirement  $E_{HT}$  becomes:

$$E_{HT} = \sum_{i=1}^N E_{Hi} \quad (5)$$

(where e.g.,  $N = 12$  if  $E_{HT}$  is calculated on a monthly basis).

The concept also lends itself to different levels of complexity in calculating each factor in Eq. (2) and (3). This method implicitly assumes that storage in the building is adequate to average out and use the free heat provided from internal gains and sunlight. Since it is known that passive solar buildings continue to require auxiliary heating when the average value of the free heat ( $Q_s$ ) is greater than the average losses, the VBDD method should not be used for buildings where a large portion of the heat is provided by  $Q_{Solar}$ . Methods suitable for use on such buildings are described in Section IV.

MILWAUKEE

SEP 22 2003

SCANNED

RU 11 2000

## Weather Data and Design Conditions

24.7

TABLE 1 CLIMATIC CONDITIONS FOR THE UNITED STATES\*

| Col. 1<br>State and Station | Col. 2<br>Latitude <sup>b</sup> | Col. 3<br>Longitude <sup>c</sup> | Col. 4<br>Elevation <sup>c</sup><br>Ft | Winter <sup>d</sup> F |           | Summer <sup>e</sup> F                           |      |       | Col. 7<br>Mean<br>Daily<br>Range | Col. 8<br>Design Wet-Bulb |      |    |    |    |
|-----------------------------|---------------------------------|----------------------------------|----------------------------------------|-----------------------|-----------|-------------------------------------------------|------|-------|----------------------------------|---------------------------|------|----|----|----|
|                             |                                 |                                  |                                        | Design Dry-Bulb       | 99% 97.5% | Design Dry-Bulb and<br>Mean Coincident Wet-Bulb |      | 5%    |                                  | Design Wet-Bulb           |      |    |    |    |
|                             |                                 |                                  |                                        |                       |           | 1%                                              | 2.5% |       |                                  | 1%                        | 2.5% | 5% |    |    |
| Cape Kennedy AP             | 28                              | 3                                | 80                                     | 3                     | 16        | 35                                              | 38   | 90/78 | 88/78                            | 87/78                     | 15   | 80 | 79 | 79 |
| Daytona Beach AP            | 29                              | 1                                | 81                                     | 0                     | 31        | 32                                              | 35   | 92/78 | 90/77                            | 88/77                     | 15   | 80 | 79 | 78 |
| Fort Lauderdale             | 26                              | 0                                | 80                                     | 1                     | 13        | 42                                              | 46   | 92/78 | 91/78                            | 90/78                     | 15   | 80 | 79 | 79 |
| Fort Myers AP               | 26                              | 4                                | 81                                     | 5                     | 13        | 41                                              | 44   | 93/78 | 92/78                            | 91/77                     | 18   | 80 | 79 | 79 |
| Fort Pierce                 | 27                              | 3                                | 80                                     | 2                     | 10        | 38                                              | 42   | 91/78 | 90/78                            | 89/78                     | 15   | 80 | 79 | 79 |
| Gainesville AP (S)          | 29                              | 4                                | 82                                     | 2                     | 155       | 28                                              | 31   | 95/77 | 93/77                            | 92/77                     | 18   | 80 | 79 | 78 |
| Jacksonville AP             | 30                              | 3                                | 81                                     | 4                     | 24        | 29                                              | 32   | 96/77 | 94/77                            | 92/76                     | 19   | 79 | 79 | 78 |
| Key West AP                 | 24                              | 3                                | 81                                     | 5                     | 6         | 55                                              | 57   | 90/78 | 90/78                            | 89/78                     | 9    | 80 | 79 | 79 |
| Lakeland CO (S)             | 28                              | 0                                | 82                                     | 0                     | 214       | 39                                              | 41   | 93/76 | 91/76                            | 89/76                     | 17   | 79 | 78 | 78 |
| Miami AP (S)                | 25                              | 5                                | 80                                     | 2                     | 7         | 44                                              | 47   | 91/77 | 90/77                            | 89/77                     | 15   | 79 | 79 | 78 |
| Miami Beach CO              | 25                              | 5                                | 80                                     | 1                     | 9         | 45                                              | 48   | 90/77 | 89/77                            | 88/77                     | 10   | 79 | 79 | 78 |
| Ocala                       | 29                              | 1                                | 82                                     | 1                     | 86        | 31                                              | 34   | 95/77 | 93/77                            | 92/76                     | 18   | 80 | 79 | 78 |
| Orlando AP                  | 28                              | 3                                | 81                                     | 2                     | 106r      | 35                                              | 38   | 94/76 | 93/76                            | 91/76                     | 17   | 79 | 78 | 78 |
| Panama City,<br>Tyndall AFB | 30                              | 0                                | 85                                     | 4                     | 22        | 29                                              | 33   | 92/78 | 90/77                            | 89/77                     | 14   | 81 | 80 | 79 |
| Pensacola CO                | 30                              | 3                                | 87                                     | 1                     | 13        | 25                                              | 29   | 94/77 | 93/77                            | 91/77                     | 14   | 80 | 79 | 79 |
| St. Augustine               | 29                              | 5                                | 81                                     | 2                     | 15        | 31                                              | 35   | 92/78 | 89/78                            | 87/78                     | 16   | 80 | 79 | 79 |
| St. Petersburg              | 28                              | 0                                | 82                                     | 4                     | 35        | 36                                              | 40   | 92/77 | 91/77                            | 90/76                     | 16   | 79 | 79 | 78 |
| Sanford                     | 28                              | 5                                | 81                                     | 2                     | 14        | 35                                              | 38   | 94/76 | 93/76                            | 91/76                     | 17   | 79 | 78 | 78 |
| Sarasota                    | 27                              | 2                                | 82                                     | 3                     | 30        | 39                                              | 42   | 93/77 | 92/77                            | 90/76                     | 17   | 79 | 79 | 78 |
| Tallahassee AP (S)          | 30                              | 2                                | 84                                     | 2                     | 58        | 27                                              | 30   | 94/77 | 92/76                            | 90/76                     | 19   | 79 | 78 | 78 |
| Tampa AP (S)                | 28                              | 0                                | 82                                     | 3                     | 19        | 36                                              | 40   | 92/77 | 91/77                            | 90/76                     | 17   | 79 | 79 | 78 |
| West Palm<br>Beach AP       | 26                              | 4                                | 80                                     | 1                     | 15        | 41                                              | 45   | 92/78 | 91/78                            | 90/78                     | 16   | 80 | 79 | 79 |
| GEORGIA                     |                                 |                                  |                                        |                       |           |                                                 |      |       |                                  |                           |      |    |    |    |
| Albany, Turner AFB          | 31                              | 3                                | 84                                     | 1                     | 224       | 25                                              | 29   | 97/77 | 95/76                            | 93/76                     | 20   | 80 | 79 | 78 |
| Americus                    | 32                              | 0                                | 84                                     | 2                     | 476       | 21                                              | 25   | 97/77 | 94/76                            | 92/75                     | 20   | 79 | 78 | 77 |
| Athens                      | 34                              | 0                                | 83                                     | 2                     | 700       | 18                                              | 22   | 94/74 | 92/74                            | 90/74                     | 21   | 78 | 77 | 76 |
| Atlanta AP (S)              | 33                              | 4                                | 84                                     | 3                     | 1005      | 17                                              | 22   | 94/74 | 92/74                            | 90/73                     | 19   | 77 | 76 | 75 |
| Augusta AP                  | 33                              | 2                                | 82                                     | 0                     | 143       | 20                                              | 23   | 97/77 | 95/76                            | 93/76                     | 19   | 80 | 79 | 78 |
| Brunswick                   | 31                              | 1                                | 81                                     | 3                     | 14        | 29                                              | 32   | 92/78 | 89/78                            | 87/78                     | 18   | 80 | 79 | 79 |
| Columbus,<br>Lawson AFB     | 32                              | 3                                | 85                                     | 0                     | 242       | 21                                              | 24   | 95/76 | 93/76                            | 91/75                     | 21   | 79 | 78 | 77 |
| Dalton                      | 34                              | 5                                | 85                                     | 0                     | 720       | 17                                              | 22   | 94/76 | 93/76                            | 91/76                     | 22   | 79 | 78 | 77 |
| Dublin                      | 32                              | 3                                | 83                                     | 0                     | 215       | 21                                              | 25   | 96/77 | 93/76                            | 91/75                     | 20   | 79 | 78 | 77 |
| Gainesville                 | 34                              | 2                                | 83                                     | 5                     | 1254      | 16                                              | 21   | 93/74 | 91/74                            | 89/73                     | 21   | 77 | 76 | 75 |
| Griffin (S)                 | 33                              | 1                                | 84                                     | 2                     | 980       | 18                                              | 22   | 93/76 | 90/75                            | 88/74                     | 21   | 78 | 77 | 76 |
| La Grange                   | 33                              | 0                                | 85                                     | 0                     | 715       | 19                                              | 23   | 94/76 | 91/75                            | 89/74                     | 21   | 78 | 77 | 76 |
| Macon AP                    | 32                              | 4                                | 83                                     | 4                     | 356       | 21                                              | 25   | 96/77 | 93/76                            | 91/75                     | 22   | 79 | 78 | 77 |
| Marietta,<br>Dobbins AFB    | 34                              | 0                                | 84                                     | 3                     | 1016      | 17                                              | 21   | 94/74 | 92/74                            | 90/74                     | 21   | 78 | 77 | 76 |
| Moultrie                    | 31                              | 1                                | 83                                     | 4                     | 340       | 27                                              | 30   | 97/77 | 95/77                            | 92/76                     | 20   | 80 | 79 | 78 |
| Rome AP                     | 34                              | 2                                | 85                                     | 1                     | 637       | 17                                              | 22   | 94/76 | 93/76                            | 91/76                     | 23   | 79 | 78 | 77 |
| Savannah-Travis AP          | 32                              | 1                                | 81                                     | 1                     | 52        | 24                                              | 27   | 96/77 | 93/77                            | 91/77                     | 20   | 80 | 79 | 78 |
| Valdosta-Moody AFB          | 31                              | 0                                | 83                                     | 1                     | 239       | 28                                              | 31   | 96/77 | 94/77                            | 92/76                     | 20   | 80 | 79 | 78 |
| Waycross                    | 31                              | 2                                | 82                                     | 2                     | 140       | 26                                              | 29   | 96/77 | 94/77                            | 91/76                     | 20   | 80 | 79 | 78 |
| HAWAII                      |                                 |                                  |                                        |                       |           |                                                 |      |       |                                  |                           |      |    |    |    |
| Hilo AP (S)                 | 19                              | 4                                | 155                                    | 1                     | 31        | 61                                              | 62   | 84/73 | 83/72                            | 82/72                     | 15   | 75 | 74 | 74 |
| Honolulu AP                 | 21                              | 2                                | 158                                    | 0                     | 7         | 62                                              | 63   | 87/73 | 86/73                            | 85/72                     | 12   | 76 | 75 | 74 |
| Kaneohe Bay MCAS            | 21                              | 2                                | 157                                    | 5                     | 18        | 65                                              | 66   | 85/75 | 84/74                            | 83/74                     | 12   | 76 | 76 | 75 |
| Wahiawa                     | 21                              | 3                                | 158                                    | 0                     | 900       | 58                                              | 59   | 86/73 | 85/72                            | 84/72                     | 14   | 75 | 74 | 73 |
| IDAHO                       |                                 |                                  |                                        |                       |           |                                                 |      |       |                                  |                           |      |    |    |    |
| Boise AP(S)                 | 43                              | 3                                | 116                                    | 1                     | 2842      | 3                                               | 10   | 96/65 | 94/64                            | 91/64                     | 31   | 68 | 66 | 65 |
| Burley                      | 42                              | 3                                | 113                                    | 5                     | 4180      | -3                                              | 2    | 99/62 | 95/61                            | 92/66                     | 35   | 64 | 63 | 61 |
| Coeur d'Alene AP            | 47                              | 5                                | 116                                    | 5                     | 2973      | -8                                              | -1   | 89/62 | 86/61                            | 83/60                     | 31   | 64 | 63 | 61 |
| Idaho Falls AP              | 43                              | 3                                | 112                                    | 0                     | 4730r     | -11                                             | -6   | 89/61 | 87/61                            | 84/59                     | 38   | 65 | 63 | 61 |
| Lewiston AP                 | 46                              | 2                                | 117                                    | 0                     | 1413      | -1                                              | 6    | 96/65 | 93/64                            | 90/63                     | 32   | 67 | 66 | 64 |
| Moscow                      | 46                              | 4                                | 117                                    | 0                     | 2660      | -7                                              | 0    | 90/63 | 87/62                            | 84/61                     | 32   | 65 | 64 | 62 |
| Mountain Home AFB           | 43                              | 0                                | 115                                    | 5                     | 2992      | -6                                              | 12   | 99/64 | 97/63                            | 94/62                     | 36   | 66 | 65 | 63 |
| Pocatello AP                | 43                              | 0                                | 112                                    | 4                     | 4444      | -8                                              | -1   | 94/61 | 91/60                            | 89/59                     | 35   | 64 | 63 | 61 |
| Twin Falls AP (S)           | 42                              | 3                                | 114                                    | 3                     | 4148      | -3                                              | 2    | 99/62 | 95/61                            | 92/60                     | 34   | 64 | 63 | 61 |

SCANNED

APR 22 2003

111 7 3 2003

## IDAHO

## MONTHLY AND ANNUAL HEATING DEGREE DAY NORMALS

| STATION                 | JUL | AUG | SEP | OCT | NOV  | DEC  | JAN  | FEB  | MAR  | APR | MAY | JUN | ANNUAL |
|-------------------------|-----|-----|-----|-----|------|------|------|------|------|-----|-----|-----|--------|
| ABERDEEN EXP STATION    | 14  | 44  | 242 | 567 | 915  | 1221 | 1390 | 1047 | 942  | 612 | 362 | 161 | 7402   |
| AMERICAN FALLS 1 SW     | 0   | 20  | 170 | 408 | 895  | 1141 | 1260 | 906  | 898  | 576 | 335 | 145 | 6902   |
| ANDERSON DAM            | 0   | 12  | 143 | 109 | 703  | 1082 | 1203 | 963  | 880  | 540 | 284 | 121 | 6430   |
| ARROWROCK DAM           | 0   | 14  | 150 | 160 | 810  | 1091 | 1315 | 935  | 837  | 529 | 288 | 117 | 6461   |
| ASHTON 1 S              | 70  | 123 | 338 | 839 | 1035 | 1398 | 1460 | 1187 | 1189 | 729 | 434 | 251 | 8793   |
| AVERT R 1 NO 2          | 36  | 50  | 211 | 519 | 870  | 1094 | 1163 | 899  | 859  | 573 | 333 | 163 | 8750   |
| BLACKFOOT 2 SSW         | 7   | 23  | 200 | 487 | 878  | 1107 | 1290 | 994  | 893  | 546 | 290 | 118 | 8922   |
| BLISS                   | 0   | 13  | 139 | 411 | 705  | 1046 | 1144 | 874  | 779  | 474 | 242 | 88  | 5970   |
| BOISE HQ                | 0   | 12  | 127 | 404 | 750  | 1020 | 1116 | 826  | 741  | 480 | 252 | 97  | 5833   |
| BONNERS FERRY 1 SW      | 31  | 71  | 253 | 590 | 918  | 1125 | 1240 | 949  | 877  | 558 | 323 | 148 | 7081   |
| BURLEY FAN AIRPORT      | 0   | 20  | 204 | 505 | 834  | 1107 | 1221 | 827  | 850  | 573 | 331 | 141 | 8731   |
| CALDWELL                | 0   | 20  | 150 | 440 | 766  | 1011 | 1107 | 804  | 681  | 420 | 217 | 95  | 8736   |
| CAMBRIDGE               | 12  | 35  | 184 | 512 | 855  | 1156 | 1318 | 1005 | 840  | 504 | 279 | 119 | 8608   |
| CASCADE 1 NW            | 85  | 136 | 354 | 857 | 983  | 1287 | 1389 | 1126 | 1094 | 759 | 518 | 323 | 8720   |
| CHALLIS                 | 27  | 66  | 237 | 558 | 940  | 1306 | 1407 | 1072 | 970  | 621 | 381 | 187 | 7701   |
| CHILLY BARTON FLAT      | 157 | 223 | 438 | 747 | 1118 | 1400 | 1603 | 1291 | 1209 | 816 | 561 | 351 | 10000  |
| COCOA D'ALENE 1 E       | 16  | 44  | 192 | 502 | 825  | 1043 | 1165 | 898  | 839  | 564 | 316 | 142 | 8922   |
| CONDA                   | 86  | 118 | 350 | 878 | 1050 | 1352 | 1451 | 1212 | 1206 | 804 | 521 | 312 | 9132   |
| COUNCIL                 | 0   | 25  | 183 | 474 | 831  | 1129 | 1246 | 988  | 853  | 519 | 283 | 122 | 8610   |
| DEADWOOD DAM            | 160 | 202 | 405 | 704 | 1044 | 1376 | 1454 | 1173 | 1178 | 854 | 614 | 381 | 8555   |
| DEER FLAT DAM           | 0   | 12  | 137 | 428 | 783  | 1001 | 1110 | 818  | 707  | 439 | 230 | 78  | 5709   |
| DRIGGS                  | 81  | 113 | 349 | 860 | 1065 | 1367 | 1478 | 1207 | 1187 | 788 | 524 | 309 | 9123   |
| DUBOIS EXP STATION      | 20  | 48  | 259 | 598 | 1020 | 1342 | 1497 | 1100 | 1150 | 705 | 419 | 216 | 8424   |
| EMMETT 2 E              | 0   | 10  | 139 | 412 | 750  | 895  | 1084 | 804  | 691  | 423 | 216 | 84  | 5823   |
| FERN RANGER STATION     | 5   | 19  | 187 | 481 | 789  | 1020 | 1110 | 832  | 775  | 498 | 283 | 105 | 6090   |
| FORT HALL INDIAN AGENCY | 0   | 28  | 193 | 505 | 882  | 1184 | 1280 | 894  | 911  | 588 | 333 | 138 | 7044   |
| GARDEN VALLEY RS        | 16  | 30  | 181 | 508 | 878  | 1163 | 1249 | 848  | 862  | 541 | 320 | 145 | 8867   |
| GLENN FERRY             | 0   | 15  | 137 | 380 | 728  | 983  | 1070 | 788  | 698  | 411 | 187 | 51  | 5469   |
| GRACE                   | 47  | 84  | 288 | 611 | 987  | 1302 | 1411 | 1162 | 1107 | 717 | 450 | 252 | 8419   |
| GRAND VIEW 2 W          | 0   | 11  | 124 | 403 | 753  | 1017 | 1084 | 780  | 689  | 389 | 172 | 63  | 5507   |
| GRANDVILLE              | 55  | 108 | 261 | 555 | 850  | 1066 | 1159 | 902  | 893  | 633 | 425 | 231 | 7146   |
| HAILEY RANGER STATION   | 34  | 75  | 258 | 570 | 888  | 1314 | 1423 | 1157 | 1019 | 681 | 418 | 225 | 8184   |
| HAILEYTON               | 7   | 22  | 165 | 455 | 804  | 1078 | 1187 | 899  | 810  | 522 | 285 | 109 | 6353   |
| HILL CITY               | 46  | 89  | 310 | 839 | 1005 | 1358 | 1504 | 1228 | 1170 | 738 | 459 | 288 | 8830   |
| HOLLISTER               | 8   | 36  | 207 | 484 | 822  | 1076 | 1169 | 910  | 877  | 581 | 362 | 183 | 8725   |
| IDAHO CITY              | 45  | 91  | 289 | 597 | 906  | 1180 | 1296 | 1025 | 873  | 651 | 412 | 218 | 7643   |
| IDAHO FALLS FAN RP      | 10  | 47  | 252 | 590 | 963  | 1302 | 1428 | 1117 | 1008 | 635 | 371 | 178 | 7888   |
| IDAHO FALLS 46 W        | 31  | 67  | 283 | 681 | 1053 | 1407 | 1507 | 1210 | 1104 | 690 | 412 | 204 | 8619   |
| ISLAND PARK DAM         | 147 | 197 | 441 | 786 | 1181 | 1497 | 1603 | 1330 | 1242 | 821 | 614 | 375 | 10394  |
| JEROME                  | 0   | 10  | 148 | 435 | 792  | 1078 | 1181 | 804  | 816  | 604 | 274 | 106 | 6266   |
| KELLOGG                 | 34  | 76  | 222 | 533 | 849  | 1073 | 1181 | 896  | 859  | 573 | 339 | 163 | 8708   |
| KODIAK                  | 0   | 24  | 147 | 443 | 780  | 902  | 1089 | 778  | 704  | 447 | 235 | 92  | 5730   |
| KUNA 2 NNE              | 8   | 20  | 166 | 440 | 768  | 1020 | 1116 | 826  | 735  | 471 | 267 | 105 | 5940   |
| LEWISTON WSO            | 0   | 17  | 124 | 409 | 735  | 936  | 1048 | 753  | 685  | 441 | 233 | 84  | 5464   |
| LIFTON PUMPING STATION  | 21  | 72  | 316 | 657 | 1014 | 1327 | 1466 | 1266 | 1218 | 768 | 440 | 213 | 8778   |
| LOWMAN 3 E NO 2         | 87  | 102 | 291 | 586 | 939  | 1216 | 1298 | 997  | 846  | 638 | 432 | 227 | 7720   |
| MCKAY RANGER STATION    | 45  | 91  | 284 | 614 | 1020 | 1302 | 1428 | 1117 | 1008 | 635 | 371 | 178 | 7888   |
| MILAD                   | 0   | 18  | 188 | 493 | 879  | 1184 | 1293 | 1028 | 924  | 579 | 330 | 147 | 7081   |
| MAY RANGER STATION      | 54  | 89  | 304 | 611 | 1005 | 1358 | 1463 | 1117 | 1011 | 675 | 431 | 239 | 8367   |
| MC CALL                 | 96  | 162 | 372 | 678 | 1014 | 1286 | 1411 | 1158 | 1183 | 840 | 561 | 330 | 9077   |
| MONTPELIER RANGER STA   | 46  | 84  | 312 | 654 | 1032 | 1349 | 1457 | 1228 | 1184 | 760 | 485 | 284 | 8829   |
| POSCOW U OF I           | 44  | 80  | 208 | 493 | 813  | 1039 | 1150 | 865  | 822  | 581 | 357 | 182 | 8614   |
| MOUNTAIN HOME           | 0   | 30  | 152 | 420 | 768  | 1029 | 1129 | 891  | 772  | 483 | 282 | 97  | 5879   |
| NEW MEADOWS RANGER STA  | 90  | 134 | 372 | 665 | 990  | 1308 | 1429 | 1123 | 1078 | 720 | 450 | 278 | 8716   |
| NEZPERCE                | 68  | 97  | 282 | 581 | 873  | 1088 | 1200 | 921  | 899  | 630 | 415 | 238 | 7250   |
| OAKLEY                  | 0   | 28  | 178 | 450 | 786  | 1051 | 1144 | 888  | 840  | 581 | 340 | 153 | 6428   |
| ORFVING                 | 0   | 13  | 119 | 425 | 744  | 981  | 1087 | 758  | 691  | 414 | 200 | 71  | 5454   |
| PARMA EXPERIMENT STA    | 7   | 18  | 151 | 456 | 783  | 1035 | 1144 | 837  | 718  | 441 | 235 | 101 | 5929   |
| PAUL 1 ENE              | 0   | 40  | 210 | 510 | 843  | 1107 | 1201 | 852  | 877  | 582 | 339 | 192 | 6467   |
| PATETTE                 | 0   | 7   | 128 | 428 | 774  | 1032 | 1141 | 840  | 691  | 414 | 198 | 84  | 5717   |
| PIERCE                  | 83  | 123 | 332 | 654 | 966  | 1218 | 1321 | 1033 | 1030 | 738 | 470 | 248 | 8216   |
| POCATELLO WSO           | 0   | 20  | 192 | 515 | 879  | 1181 | 1296 | 997  | 918  | 591 | 358 | 138 | 7083   |
| PORTHILL                | 38  | 81  | 273 | 617 | 827  | 1150 | 1277 | 994  | 921  | 576 | 328 | 159 | 7338   |
| POTLATCH 3 NNE          | 67  | 98  | 255 | 533 | 818  | 1026 | 1135 | 860  | 840  | 576 | 377 | 200 | 8789   |
| PRESTON 3 NE            | 9   | 27  | 209 | 531 | 891  | 1200 | 1336 | 1084 | 952  | 600 | 343 | 184 | 7379   |
| PRIEST RIVER EXP STA    | 88  | 117 | 303 | 638 | 957  | 1189 | 1280 | 1000 | 850  | 654 | 400 | 212 | 7755   |
| RICHFIELD               | 20  | 88  | 231 | 549 | 903  | 1221 | 1355 | 1075 | 944  | 618 | 368 | 179 | 7840   |
| RIDDING RANGER STATION  | 0   | 7   | 92  | 316 | 648  | 877  | 981  | 700  | 626  | 372 | 189 | 51  | 4849   |
| ST ANTHONY 1 NW         | 97  | 81  | 288 | 592 | 981  | 1311 | 1435 | 1156 | 1091 | 675 | 398 | 206 | 8311   |
| SAINT MARIES            | 40  | 77  | 222 | 521 | 840  | 1057 | 1163 | 876  | 840  | 564 | 323 | 155 | 8680   |
| SALMON 1 N              | 19  | 82  | 280 | 605 | 908  | 1318 | 1432 | 1084 | 933  | 594 | 356 | 180 | 7788   |
| SANDPOINT EXP STATION   | 52  | 97  | 277 | 598 | 897  | 1113 | 1218 | 846  | 908  | 600 | 383 | 181 | 7250   |
| SHOSHONE 1 NW           | 6   | 36  | 165 | 468 | 831  | 1156 | 1271 | 983  | 874  | 534 | 282 | 127 | 6733   |
| STREVELL                | 10  | 34  | 227 | 546 | 921  | 1203 | 1299 | 1036 | 964  | 651 | 404 | 205 | 7500   |
| SUGAR                   | 82  | 83  | 286 | 617 | 990  | 1324 | 1448 | 1156 | 1076 | 660 | 402 | 204 | 8320   |

MIL

APR 22 2003

SCANNED

JUL 11 2003

150110

## MONTHLY AND ANNUAL HEATING DEGREE DAY NORMALS

[illegible]

## MONTHLY AND ANNUAL COOLING DEGREE DAY NORMALS

| DESCRIPTION | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 | 2421 | 2422 | 2423 | 2424 | 2425 | 2426 | 2427 | 2428 | 2429 | 2430 | 2431 | 2432 | 2433 | 2434 | 2435 | 2436 | 2437 | 2438 | 2439 | 2440 | 2441 | 2442 | 2443 | 2444 | 2445 | 2446 | 2447 | 2448 | 2449 | 2450 | 2451 | 2452 | 2453 | 2454 | 2455 | 2456 | 2457 | 2458 | 2459 | 2460 | 2461 | 2462 | 2463 | 2464 | 2465 | 2466 | 2467 | 2468 | 2469 | 2470 | 2471 | 2472 | 2473 | 2474 | 2475 | 2476 | 2477 | 2478 | 2479 | 2480 | 2481 | 2482 | 2483 | 2484 | 2485 | 2486 | 2487 | 2488 | 2489 | 2490 | 2491 | 2492 | 2493 | 2494 | 2495 | 2496 | 2497 | 2498 | 2499 | 2500 | 2501 | 2502 | 2503 | 2504 | 2505 | 2506 | 2507 | 2508 | 2509 | 2510 | 2511 | 2512 | 2513 | 2514 | 2515 | 2516 | 2517 | 2518 | 2519 | 2520 | 2521 | 2522 | 2523 | 2524 | 2525 | 2526 | 2527 | 2528 | 2529 | 2530 | 2531 | 2532 | 2533 | 2534 | 2535 | 2536 | 2537 | 2538 | 2539 | 2540 | 2541 | 2542 | 2543 | 2544 | 2545 | 2546 | 2547 | 2548 | 2549 | 2550 | 2551 | 2552 | 2553 | 2554 | 2555 | 2556 | 2557 | 2558 | 2559 | 2560 | 2561 | 2562 | 2563 | 2564 | 2565 | 2566 | 2567 | 2568 | 2569 | 2570 | 2571 | 2572 | 2573 | 2574 | 2575 | 2576 | 2577 | 2578 | 2579 | 2580 | 2581 | 2582 | 2583 | 2584 | 2585 | 2586 | 2587 | 2588 | 2589 | 2590 | 2591 | 2592 | 2593 | 2594 | 2595 | 2596 | 2597 | 2598 | 2599 | 2600 | 2601 | 2602 | 2603 | 2604 | 2605 | 2606 | 2607 | 2608 | 2609 | 2610 | 2611 | 2612 | 2613 | 2614 | 2615 | 2616 | 2617 | 2618 | 2619 | 2620 | 2621 | 2622 | 2623 | 2624 | 2625 | 2626 | 2627 | 2628 | 2629 | 2630 | 2631 | 2632 | 2633 | 2634 | 2635 | 2636 | 2637 | 2638 | 2639 | 2640 | 2641 | 2642 | 2643 | 2644 | 2645 | 2646 | 2647 | 2648 | 2649 | 2650 | 2651 | 2652 | 2653 | 2654 | 2655 | 2656 | 2657 | 2658 | 2659 | 2660 | 2661 | 2662 | 2663 | 2664 | 2665 | 2666 | 2667 | 2668 | 2669 | 2670 | 2671 | 2672 | 2673 | 2674 | 2675 | 2676 | 2677 | 2678 | 2679 | 2680 | 2681 | 2682 | 2683 | 2684 | 2685 | 2686 | 2687 | 2688 | 2689 | 2690 | 2691 | 2692 | 2693 | 2694 | 2695 | 2696 | 2697 | 2698 | 2699 | 2700 | 2701 | 2702 | 2703 | 2704 | 2705 | 2706 | 2707 | 2708 | 2709 | 2710 | 2711 | 2712 | 2713 | 2714 | 2715 | 2716 | 2717 | 2718 | 2719 | 2720 | 2721 | 2722 | 2723 | 2724 | 2725 | 2726 | 2727 | 2728 | 2729 | 2730 | 2731 | 2732 | 2733 | 2734 | 2735 | 2736 | 2737 | 2738 | 2739 | 2740 | 2741 | 2742 | 2743 | 2744 | 2745 | 2746 | 2747 | 2748 | 2749 | 2750 | 2751 | 2752 | 2753 | 2754 | 2755 | 2756 | 2757 | 2758 | 2759 | 2760 | 2761 | 2762 | 2763 | 2764 | 2765 | 2766 | 2767 | 2768 | 2769 | 2770 | 2771 | 2772 | 2773 | 2774 | 2775 | 2776 | 2777 | 2778 | 2779 | 2780 | 2781 | 2782 | 2783 | 2784 | 2785 | 2786 | 2787 | 2788 | 2789 | 2790 | 2791 | 2792 | 2793 | 2794 | 2795 | 2796 | 2797 | 2798 | 2799 | 2800 | 2801 | 2802 | 2803 | 2804 | 2805 | 2806 | 2807 | 2808 | 2809 | 2810 | 2811 | 2812 | 2813 | 2814 | 2815 | 2816 | 2817 | 2818 | 2819 | 2820 | 2821 | 2822 | 2823 | 2824 | 2825 | 2826 | 2827 | 2828 | 2829 | 2830 | 2831 | 2832 | 2833 | 2834 | 2835 | 2836 | 2837 | 2838 | 2839 | 2840 | 2841 | 2842 | 2843 | 2844 | 2845 | 2846 | 2847 | 2848 | 2849 | 2850 | 2851 | 2852 | 2853 | 2854 | 2855 | 2856 | 2857 | 2858 | 2859 | 2860 | 2861 | 2862 | 2863 | 2864 | 2865 | 2866 | 2867 | 2868 | 2869 | 2870 | 2871 | 2872 | 2873 | 2874 | 2875 | 2876 | 2877 | 2878 | 2879 | 2880 | 2881 | 2882 | 2883 | 2884 | 2885 | 2886 | 2887 | 2888 | 2889 | 2890 | 2891 | 2892 | 2893 | 2894 | 2895 | 2896 | 2897 | 2898 | 2899 | 2900 | 2901 | 2902 | 2903 | 2904 | 2905 | 2906 | 2907 | 2908 | 2909 | 2910 | 2911 | 2912 | 2913 | 2914 | 2915 | 2916 | 2917 | 2918 | 2919 | 2920 | 2921 | 2922 | 2923 | 2924 | 2925 | 2926 | 2927 | 2928 | 2929 | 2930 | 2931 | 2932 | 2933 | 2934 | 2935 | 2936 | 2937 | 2938 | 2939 | 2940 | 2941 | 2942 | 2943 | 2944 | 2945 | 2946 | 2947 | 2948 | 2949 | 2950 | 2951 | 2952 | 2953 | 2954 | 2955 | 2956 | 2957 | 2958 | 2959 | 2960 | 2961 | 2962 | 2963 | 2964 | 2965 | 2966 | 2967 | 2968 | 2969 | 2970 | 2971 | 2972 | 2973 | 2974 | 2975 | 2976 | 2977 | 2978 | 2979 | 2980 | 2981 | 2982 | 2983 | 2984 | 2985 | 2986 | 2987 | 2988 | 2989 | 2990 | 2991 | 2992 | 2993 | 2994 | 2995 | 2996 | 2997 | 2998 | 2999 | 3000 |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

SCANNED

Wm. A. Smith

 $\text{Al}(\text{C}_2\text{H}_5)_3$ 

APR 22 2003

## IDAHO

## MONTHLY AND ANNUAL COOLING DEGREE DAY NORMALS

| STATION                 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANNUAL |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| MASCOM U BF 3           | 0   | 0   | 0   | 0   | 6   | 23  | 100 | 102 | 20  | 0   | 0   | 0   | 230    |
| MOUNTAIN HOME           | 0   | 0   | 0   | 0   | 20  | 86  | 281 | 225 | 74  | 11  | 0   | 0   | 898    |
| NEW HENDON WINGED STA   | 0   | 0   | 0   | 0   | 0   | 0   | 28  | 27  | 6   | 0   | 0   | 0   | 61     |
| NEZPERCE                | 0   | 0   | 0   | 0   | 0   | 11  | 71  | 81  | 22  | 0   | 0   | 0   | 185    |
| OAKLEY                  | 0   | 0   | 0   | 0   | 11  | 42  | 191 | 155 | 38  | 7   | 0   | 0   | 444    |
| OROFINO                 | 0   | 0   | 0   | 0   | 20  | 82  | 281 | 218 | 10  | 0   | 0   | 0   | 640    |
| PRIMA EXPERIMENT STA    | 0   | 0   | 0   | 0   | 22  | 98  | 252 | 183 | 42  | 0   | 0   | 0   | 608    |
| PAUL J ENG              | 0   | 0   | 0   | 0   | 7   | 35  | 168 | 136 | 21  | 0   | 0   | 0   | 370    |
| PAYETTE                 | 0   | 0   | 0   | 0   | 24  | 103 | 304 | 230 | 58  | 0   | 0   | 0   | 720    |
| PIERCE                  | 0   | 0   | 0   | 0   | 6   | 11  | 55  | 44  | 11  | 0   | 0   | 0   | 128    |
| POCATELLO LSO           | 0   | 0   | 0   | 0   | 3   | 42  | 205 | 155 | 24  | 0   | 0   | 0   | 437    |
| POTILL                  | 0   | 0   | 0   | 0   | 0   | 21  | 97  | 71  | 12  | 0   | 0   | 0   | 191    |
| POTLATCH 3 NW           | 0   | 0   | 0   | 0   | 6   | 17  | 76  | 62  | 16  | 0   | 0   | 0   | 174    |
| PRESTON 3 NW            | 0   | 0   | 0   | 0   | 0   | 25  | 161 | 130 | 25  | 0   | 0   | 0   | 352    |
| PRIEST RIVER LSW STA    | 0   | 0   | 0   | 0   | 0   | 11  | 48  | 49  | 8   | 0   | 0   | 0   | 114    |
| RICHFIELD               | 0   | 0   | 0   | 0   | 8   | 28  | 141 | 116 | 21  | 0   | 0   | 0   | 312    |
| RIDGINS RAMPART STATION | 0   | 0   | 0   | 0   | 14  | 112 | 317 | 327 | 143 | 15  | 0   | 0   | 964    |
| ST ANTHONY 3 NW         | 0   | 0   | 0   | 0   | 0   | 11  | 116 | 96  | 9   | 0   | 0   | 0   | 190    |
| SAINT MARIES            | 0   | 0   | 0   | 0   | 0   | 26  | 114 | 105 | 27  | 0   | 0   | 0   | 272    |
| SALMON 1 N              | 0   | 0   | 0   | 0   | 3   | 22  | 112 | 87  | 10  | 0   | 0   | 0   | 238    |
| SHOOPMINT EXP STATION   | 0   | 0   | 0   | 0   | 0   | 13  | 98  | 23  | 0   | 0   | 0   | 0   | 171    |
| SHOSHONE 1 NW           | 0   | 0   | 0   | 0   | 19  | 86  | 273 | 232 | 51  | 0   | 0   | 0   | 644    |
| THREVELL                | 0   | 0   | 0   | 0   | 0   | 34  | 165 | 121 | 32  | 0   | 0   | 0   | 362    |
| SUNDA                   | 0   | 0   | 0   | 0   | 5   | 12  | 83  | 46  | 7   | 0   | 0   | 0   | 143    |
| SUN VALLEY              | 0   | 0   | 0   | 0   | 0   | 0   | 15  | 18  | 0   | 0   | 0   | 0   | 34     |
| SWAN FALLS POWER HOUSE  | 0   | 0   | 0   | 0   | 88  | 188 | 482 | 388 | 145 | 13  | 0   | 0   | 1275   |
| THREE CREEK             | 0   | 0   | 0   | 0   | 0   | 0   | 55  | 47  | 8   | 0   | 0   | 0   | 111    |
| THIN FALLS 4 NW         | 0   | 0   | 0   | 0   | 14  | 58  | 242 | 181 | 45  | 0   | 0   | 0   | 552    |
| THIN FALLS 3 SE         | 0   | 0   | 0   | 0   | 16  | 98  | 217 | 130 | 40  | 0   | 0   | 0   | 486    |
| WALLACE WOODLAND PARK   | 0   | 0   | 0   | 0   | 0   | 10  | 90  | 57  | 14  | 0   | 0   | 0   | 131    |
| WATER 2 SE              | 0   | 0   | 0   | 0   | 10  | 87  | 286 | 212 | 50  | 0   | 0   | 0   | 650    |

MICHAEL

APR 22 2001

SCANNED

JUL 11 2001



## IDAHO SECRETARY OF STATE

### Viewing Business Entity

Ben Ysursa, Secretary of State

[ [New Search](#) ] [ [Back to Summary](#) ]  
[ [Get a certificate of existence for SDRTR, LLC](#) ]

### SDRTR, LLC

930 S ANDREASEN DR SUITE H  
ESCONDIDO, CA 92029

**Type of Business:** LIMITED LIABILITY COMPANY

**Status:** EXISTING, ANREPT SENT 05 Nov 2010

**State of Origin:** IDAHO

**Date of Origination/Authorization:** 03 Jan 2006

**Current Registered Agent:** CAPITOL CORPORATE SERVICES INC  
921 S ORCHARD ST STE G  
BOISE, ID 83705

**File Number:** W46025

**Date of Last Annual Report:** 25 Jan 2011

#### Original Filing:

**Filed 03 Jan 2006** ARTICLES OF  
ORGANIZATION

[ [Help Me Print/View TIFF](#) ]

[View Image \(PDF format\)](#) [View Image \(TIFF format\)](#)

#### Amendments:

**Amendment Filed 09 Feb 2006** OTHER - ADD ONE  
MANAGER

[ [Help Me Print/View TIFF](#) ]

[View Image \(PDF format\)](#) [View Image \(TIFF format\)](#)

**Amendment Filed 02 Feb 2007** AMENDED &  
RESTATED

[View Image \(PDF format\)](#) [View Image \(TIFF format\)](#)

#### Annual Reports:

[ [Help Me Print/View TIFF](#) ]

**Report for year 2011** ANNUAL REPORT

[View Document Online](#)

**Report for year 2010** ANNUAL REPORT

[View Document Online](#)

**Report for year 2009** ANNUAL REPORT

[View Document Online](#)

**Report for year 2008** ANNUAL REPORT

[View Document Online](#)

**Report for year 2007** ANNUAL REPORT

[View Document Online](#)

**Report for year 2007** RESIGNATION  
RA

[View Image \(PDF format\)](#) [View Image \(TIFF format\)](#)

[Idaho Secretary of State's Main Page](#)

[State of Idaho Home Page](#)

Comments, questions or suggestions can be emailed to: [sosinfo@sos.idaho.gov](mailto:sosinfo@sos.idaho.gov)

|                                                                                                                                                        |                                                                                                                                             |                                                                                                                                                        |                                                                                   |             |                |                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------|----------------|----------------------|
| No. <b>W 46025</b>                                                                                                                                     | <b>Due no later than Jan 31, 2011</b><br><b>Annual Report Form</b>                                                                          |                                                                                                                                                        | 2. Registered Agent and Address<br><b>(NO PO BOX)</b>                             |             |                |                      |
| Return to:<br>SECRETARY OF STATE<br>700 WEST JEFFERSON<br>PO BOX 83720<br>BOISE, ID 83720-0080<br><br><b>NO FILING FEE IF<br/>RECEIVED BY DUE DATE</b> | 1. Mailing Address: Correct in this box if needed.<br><br>SDRTR, LLC<br>ANTHONY ROBBINS<br>930 S ANDREASEN DR SUITE H<br>ESCONDIDO CA 92029 |                                                                                                                                                        | CAPITOL CORPORATE SERVICES INC<br>921 S ORCHARD ST STE G<br>BOISE ID 83705<br>USA |             |                |                      |
|                                                                                                                                                        |                                                                                                                                             |                                                                                                                                                        | 3. <u>New</u> Registered Agent Signature:*                                        |             |                |                      |
| 4. Limited Liability Companies: Enter Names and Addresses of at least one Member or Manager.                                                           |                                                                                                                                             |                                                                                                                                                        |                                                                                   |             |                |                      |
| Office Held<br>MANAGER                                                                                                                                 | Name<br>ANTHONY ROBBINS                                                                                                                     | Street or PO Address<br>930 S ANDREASEN DR STE H                                                                                                       | City<br>ESCONDIDO                                                                 | State<br>CA | Country<br>USA | Postal Code<br>92029 |
| 5. Organized Under the Laws of:<br><br><b>ID<br/>W 46025</b>                                                                                           |                                                                                                                                             | 6. Annual Report must be signed.*<br><br>Signature: Anthony Robbins<br>Name (type or print): Anthony Robbins<br><br>Date: 01/25/2011<br>Title: Manager |                                                                                   |             |                |                      |
| Processed 01/25/2011                                                                                                                                   |                                                                                                                                             | * Electronically provided signatures are accepted as original signatures.                                                                              |                                                                                   |             |                |                      |