



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

September 8, 2014

Evan D. Miller
Powder Mountain Ski Resort
P.O. Box 270
Eden, Utah 84310

Dear Mr. Miller:

Subject: **Conditional Plan Approval**, Second Revision Pipeline Sizing - Summit at Powder Mountain PRUD Phase 1 (DS001), System #29028, File #9743

On August 19, 2014, the Division of Drinking Water (the Division) received the second revision of plans and specifications, along with an updated hydraulic model report, for the distribution system at the Summit at Powder Mountain PRUD Phase 1 from your consultant, Ryan Cathey, P.E., of NV5, Inc. The Division had given conditional plan approval to the distribution system in a letter, dated September 11, 2013 (see attached). On June 25, 2014, the Division received revised plans and specifications for the distribution system at the Summit at Powder Mountain PRUD Phase 1, that reduced line sizes in three of the four sub phases, which were mostly 10-inch and 12-inch HDPE pipe, to 8-inch HDPE pipe. The Division in the attached response letter, dated July 23, 2014, did not approve the reduced pipeline sizing because the reduced line sizes would not provide the originally required 2000 gpm fire flow. The Weber Fire District Fire Marshal, Brandon J. Thueson, had not agreed to any reduction in fire flow.

In response to the developer's desire to reduce water line size, Brandon J. Thueson issued a letter, dated August 3, 2014, on the fire flow requirements for the Summit at Powder Mountain PRUD Phase 1 development. Attached is a copy of the letter. His letter states, "The 2012 International Fire Code adopted by the State of Utah with amendments, and also adopted by the Weber Fire District (including appendix B) is the primary document driving fire flow requirements." This letter requires this development to be in compliance with Appendix B of the 2012 International Fire Code in terms of structure type and size, based on fire flow available and duration. Since the hydraulic model predicts the available fire flow, structure type and size would be limited according to Appendix B. A copy of Appendix B is also attached to this letter. Thueson's letter requires, "The developer shall prepare a written correspondence to be signed and recorded as part of the development records with Weber County regarding the restrictions of building type and size as outlined above for lots 5R and 6R. The developer shall provide a written acknowledgment of

fire flow requirements as outlined for all other areas of the development and shall agree to the follow the outlined requirements.”

A meeting was held at the Weber County Fire District’s offices on August 7, 2014, to discuss the fire flow requirements for the Summit at Powder Mountain PRUD Phase 1 development. Those in attendance included representatives from Weber County Fire District, Weber County Engineering, Powder Mountain Water and Sewer Improvement District, the Division of Drinking Water, the developer’s engineering consultant NV5, the developer’s agent Watts Enterprises, and the developer Summit Group. As a result of this meeting, the developer elected to submit “Second Revision Pipeline Sizing,” along with a new revision of the hydraulic model. From the original submittal on August 6, 2013, the submittal on December 13, 2014 for the Nest units on Lots 35 and 118, and the revisions incorporated from the second revision submittal on August 19, 2014, the following lines will be installed:

1. Summit at Powder Mountain Phase 1 – Summit Pass: HDPE DR13.5, 18-inch
2. Summit at Powder Mountain Phase 1A – Horizon Run: C900 PVC DR 18, 10-inch
3. Summit at Powder Mountain Phase 1B – Heartwood Drive: HDPE DR 13.5, 8-inch (Looped)
4. Summit at Powder Mountain Phase 1C – Copper Crest Road: HDPE DR 13.5, 8-inch (Looped)
5. Summit at Powder Mountain Phase 1C – Spring Park: HDPE DR 13.5, 10-inch (Looped with 8-inch HDPE DR 13.5 line back to Copper Crest Road)
6. Summit at Powder Mountain Phase 1B – Heartwood Drive Lot 25, 15 Nest units: HDPE DR 13.5, 8-inch (Looped)
7. Summit at Powder Mountain Phase 1D – Daybreak Ridge Lot 118, 20 Nest units: C900 PVC, 8-inch (Looped)

The water lines from the original (August 6, 2013) submittal for Daybreak Drive and Rolling Drive in the Summit at Powder Mountain Phase 1D were HDPE DR 13.5 10-inch and were approved on September 11, 2013. These lines will not be installed in 2014. Any revisions to these lines will need to be reviewed and approved by the Division of Drinking Water.

The updated hydraulic model report, received with the second revision of plans and specifications on August 19, 2014, was modified to include each fire hydrant as a node. The report shows the location of each hydrant, the total available flow, and the lots which could be served. The report also indicates the maximum square footage of the structure which could be built on each lot. The hydrant table from the report summarizes the available fire flow and a copy is attached to this letter. The constraints used in the model for the hydrant table is the system pressure could be not be less than 20 psi and the maximum flow in any pipe segment could not exceed 15 feet/sec. The maximum velocity of 15 feet/sec used in this hydraulic analysis is unusually high for drinking water lines. Typically, the Division receives hydraulic models where the velocity is limited to 10 feet/sec for fire scenarios, according to typical industry standards. Therefore, we request **using 10 feet/sec as the maximum velocity** for this and future hydraulic analyses at Powder Mountain.

The hydrant table shows that each hydrant can provide in excess of 2000 gpm fire flow, which according to appendix B from the fire code, would support structures (Type V-B) up to 6,200 square feet of fire-flow calculation area. This model demonstrates the distribution system, with line sizes as contained in the second revision and outlined in this letter, is capable of supplying peak day demand, fire flow in excess of 2000 gpm, and maintaining the minimum required distribution system pressure of 20 psi during fire flow.

We have completed our review of the Second Revision Pipeline Sizing - Summit at Powder Mountain PRUD Phase 1 (DS001) plans and specifications, stamped and signed by Ryan Cathey, P.E. and dated August 14, 2014, and find they basically comply with the applicable portions of Utah's Administrative Rules for Public Drinking Water Systems in R309. **We hereby approve the second revision to the proposed plans for the distribution system subject to the following conditions:**

1. The waterline plans for six lots (1, 2, 3, 4, 9, and 10) were not included in the plans that were submitted. These lots will be served with a branch waterline in the common driveway serving these lots. Per the hydraulic model, the drop in elevation will require a pressure reducing valve. **The waterline plans for these lots shall be submitted to the Division for review and approval prior to construction.**
2. The fire flow requirements as outlined in the August 3, 2014, letter from the Weber Fire District Fire Marshal, Brandon J. Thueson, shall be complied with. This places limitations on the structure type and size (fire-flow calculation area) that can be built on each lot, based on the available fire flow and appendix B from the fire code. **Any removal of the special restrictions and requirements this letter places on lots 5R and 6R in Phase 1A must be in writing from the Weber Fire District.**
3. The updated hydraulic model report, received with the second revision of plans and specifications on August 19, 2014, used reduced line sizes to 8-inch HDPE pipe for the Summit at Powder Mountain Phase 1D - Daybreak Drive and Rolling Drive. This change does not affect the validity and usefulness of the model in evaluating Phase 1A, 1B and 1C. **This approval letter should not be construed as an approval for revised line sizes in Phase 1D. Any revisions to these lines must be reviewed and approved by the Division of Drinking Water in a separate submittal.**

This approval pertains to construction only. **An operating permit must be obtained from the Director before the distribution system (DS001) for Summit at Powder Mountain PRUD Phase 1 may be put into service.** A checklist outlining the items required for operating permit issuance is enclosed for your information.

Approvals or permits by local authority or county may be necessary before beginning construction of this project. As the project proceeds, notice of any changes in the approved design, as well as any change affecting the quantity or quality of the delivered water, must be submitted to the

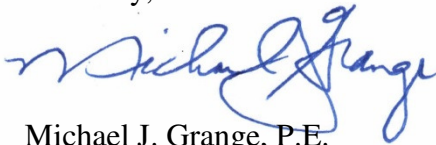
Evan D. Miller
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September 8, 2014

Division. We may also conduct interim and final inspections of this project. Please notify us when actual construction begins so that these inspections can be scheduled.

This approval must be renewed if construction has not begun or if substantial equipment has not been ordered within one year of the date of this letter.

If you have any questions regarding this letter, please contact Bob Hart, of this office, at (801) 536-0054, or Ying-Ying Macaulay, Engineering Section Manager, of this office, at (801) 536-4188.

Sincerely,



Michael J. Grange, P.E.
Acting Director

REH

Enclosure — Operating Permit Check List
Distribution System Conditional Plan Approval Letter, September 11, 2013
Revised Pipeline Sizing – Plans Not Approved Letter, July 23, 2014
Weber Fire District Fire Marshal, Brandon J. Thueson, Letter, August 3, 2014
Appendix B – 2012 International Fire Code
Hydrant Table, Hydraulic Model (Version August 14, 2014)

cc: Louis Cooper, Env. Director, Weber-Morgan Health Department, lcooper@co.weber.ut.us
John Reeve, Reeve and Associates Inc., jreeve@reeve-assoc.com
Sean Wilkinson, Weber County Planner, swilkinson@co.weber.ut.us
Jared Andersen, P.E., Weber County Engineer, jandersen@co.weber.ut.us
Dana Q. Schuler, P.E., Weber County Engineer, dshuler@co.weber.ut.us
Russ Watts, Summit Group, russ@wattsenterprises.co
Ryan Cathey, P.E., NV5, Inc., ryan.cathey@NV5.com
Bob Hart, Division of Drinking Water, bhart@utah.gov
Brandon J. Thueson, Weber Fire Marshal, bthueson@weberfd.com
Coy Porter, State Fire Marshal, coyporter@utah.gov
Ted Black, Chief Deputy State Fire Marshal, tblack@utah.gov

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Division of Drinking Water Checklist for Issuing Operating Permits

Water System Name: _____ System Number: _____

Project Description: _____ File Number: _____

The following items must be submitted and found to be acceptable for operating permit issuance with the exception of distribution lines without booster pumps and/or pressure-reducing valves. *[Waterline projects without booster pumps and/or pressure-reducing valves may be placed into service prior to submittal of all items or the Division's issuance of an operating permit if: (1) the water system has officially designated a professional engineer (P.E.) responsible for the entire water system; and, (2) if this designated P.E. has received a "Certification of Rule Conformance" statement issued by a P.E. and evidence of satisfactory bacteriological sample result. In this case, a public water system will submit all items needed for obtaining an operating permit for each distribution system project even after the new waterlines have been placed into service as determined by the water system's designated P.E.]*

- Utah Registered Engineer's Certification of Rule Conformance that all conditions of plan approval (including conditions set forth by the Division Director in any conditional approval letter) have been accomplished
- Utah Registered Engineer's statement of what plan changes, if any, were necessary during construction and a Certification of Rule Conformance that all of these changes were in accordance with applicable Utah Administrative Code, *R309-500 through R309-550, Drinking Water Facility, Construction, Design, and Operation Rules*
- As-built drawings have been received at the Division (unless no changes were made to the previously submitted and approved pre-construction drawings)
- Confirmation that the record drawings have been received by the water system (unless no changes were made to the previously submitted and approved pre-construction drawings)
- Evidence of proper flushing and disinfection in accordance with the appropriate ANSI/AWWA Standards
 - ANSI/AWWA C651-05 AWWA Standard for Disinfecting Water Mains
 - Two consecutive sample sets (each 1200 feet, end-of-line, each branch, etc.), none positive, at least 24 hours apart
 - ANSI/AWWA C652-02 AWWA Standard for Disinfection of Water-Storage Facilities
 - One or more samples, none positive
 - ANSI/AWWA C653-03 AWWA Standard for Disinfection of Water Treatment Plants
 - Two consecutive samples per unit, none positive, no less than 30 minutes apart
 - ANSI/AWWA C654-03 AWWA Standard for Disinfection of Wells
 - Two consecutive samples, none positive, no less than 30 minutes apart
- Water quality data, where appropriate *[Guidance: Include appropriate raw and finished water data that demonstrate the performance of the new treatment facility. Storage tank water should be analyzed for residual volatile organic compounds after tank interior painting or coating.]*
- Confirmation that the water system owner has received the O&M manual for the new facility
- Location data of new storage tank, treatment facility, or source, if applicable



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Kenneth H. Bousfield, P.E.
Director

September 11, 2013

Evan D. Miller
Powder Mountain Ski Resort
P.O. Box 270
Eden, UT 84310

Dear Mr. Miller:

Subject: **Conditional Plan Approval**, Summit at Powder Mountain PRUD Phase 1 (DS001 Distribution System), and **Exception to R309-105-9** Pressure Requirements, System #29028, File #9318

On August 6, 2013, the Division of Drinking Water (the Division) received the plans and specifications for the distribution system for Phase 1 of the Summit at Powder Mountain PRUD from your consultant, Ryan Cathey, P.E., of NV5, Inc. Also received on this date was the updated Hydraulic Model for Phase 1 only, and an exception request to water distribution system pressure requirement in R309-105-9. The Division received the preliminary engineer design plans for the distribution system and draft Hydraulic Model Report on March 18, 2013. The Division provided review comments on these documents in a letter dated July 17, 2013 from Bob Hart, P.E. Mr. Cathey provided a response to the review comments in a letter dated August 8, 2013.

The Summit Group's Master Plan shows the development of 2,500 estate homes, condos, town houses, and cabins at the Powder Mountain Resort. The Phase 1 of the Summit at Powder Mountain PRUD has the potential for 154 connections to the water system. The following water infrastructure being developed by the Summit Group will become part of the Powder Mountain Water and Sewer District:

- The distribution system serving Phase 1 of the Summit at Powder Mountain PRUD (154 connections) is reviewed under File #9318.
- The drilling of the Hidden Valley PWS Well (WS008) to provide water to Phase 1 of the Summit at Powder Mountain PRUD is being reviewed under Project #9428.
- The construction of the Hidden Lake 415K Gallon Tank (ST004) and the well equipping of the Hidden Lake PWS Well (WS008) (Project #9319) were approved by the Division in a letter dated July 22, 2013.

Our understanding of the project for the Phase 1 distribution system is the installation of a 16-inch water line in the Summit Pass roadway, which will become a county road, to deliver water to four areas in Phase 1 of the Summit at Powder Mountain PRUD. There are five sets of drawings that were submitted:

1. Summit at Powder Mountain Phase 1 – Summit Pass & Spring Park
2. Summit at Powder Mountain Phase 1A – Horizon Run
3. Summit at Powder Mountain Phase 1B – Heartwood Drive
4. Summit at Powder Mountain Phase 1C – Copper Crest Road
5. Summit at Powder Mountain Phase 1D – Meridian Ave., Daybreak Ridge, and Rolling Drive

There will be one pressure reducing valve station in the Summit Pass roadway. The piping for the distribution system will be approximately 23,500 feet of HDPE pipe. The water lines in the four areas are mostly 10-inch and 12-inch HDPE pipe. Approximately 30 fire hydrants will be installed.

We have completed our review of the plans and specifications, stamped and signed by Ryan Cathey, P.E., and dated July 30, 2013, and find they basically comply with the applicable portions of Utah's Administrative Rules for Public Drinking Water Systems in R309. **We hereby approve the proposed plans to construct the distribution system (DS001) for Phase 1 of the Summit at Powder Mountain PRUD subject to the following conditions:**

1. The waterline plans for six lots (1, 2, 3, 4, 9, and 10) were not included in the plans that were submitted. These lots will be served with a branch waterline in the common driveway serving these lots. Per the hydraulic model, the drop in elevation will require a pressure reducing valve. **The waterline plans for these lots shall be submitted to the Division for review and approval prior to construction.**
2. The waterline plans to serve 15 nest cabins on lot 35 off Heartwood Drive were not included in the plans that were submitted. **The waterline plans for the 15 nest cabins shall be submitted to the Division for review and approval prior to construction.**
3. The waterline plans to serve 20 nest cabins on lot 116 off Daybreak Ridge Drive were not included in the plans that were submitted. **The waterline plans for the 20 nest cabins shall be submitted to the Division for review and approval prior to construction.**

Ryan Cathey, P.E., requested that the Director, per State of Utah Administrative Rules for Public Drinking Water Systems R309-500-4, titled Authority grant an exception to Rule R309-105-9 Minimum Water Pressure. This rule requires all new water systems shall be designed and shall meet the following minimum water pressures at points of connection:

- (a) 20 psi during conditions of fire flow and fire demand experienced during peak day demand;
- (b) 30 psi during peak instantaneous demand; and,
- (c) 40 psi during peak day demand.

The hydraulic model shows that lots 24-34 for single family homes and lot 35 which will have 15 nest cabins cannot meet the 40 psi minimum peak day demand for all operating conditions. If the storage tank is full, 46.0 psi pressure is provided to these lots during peak day demand, but at the lowest operating level of the tank (only the 250,000 gallons of fire storage left in the tank); only 38.0 psi pressure is provided to these lots during peak day demand. If the storage tank was essentially empty, 34.0 psi is provided to these lots during peak day demand. The condition where peak day demand would be less than the required 40 psi would be unusual and temporary. The water system meets the minimum pressure requirements in all scenarios of peak instantaneous demand and peak day demand with fire flow. There is not a site to locate the storage tank at a higher elevation without going a considerable distant. Due to the conditions of the earthwork at the Hidden Lake 415K Gallon Tank site, the cost associated with raising the tank elevation is cost prohibitive. The water system is proposing to build the tank as designed in the Hidden Lake 415K Gallon Tank project (File #9319).

The Division concurs with your evaluation of the pressure provided to the single family homes on lots 24-34 and the 15 nest cabins on lot 35. There would be minimal improvement to the protection of public health, if any, from modifying the tank design to a higher elevation. The proposed design of the distribution system and the storage tank elevation meets the intent of the rule in providing adequate pressure to all connections. The cost to correct the slight decrease to under 40 psi during peak demand and the unusual condition of the tank being at its lowest operating level, is not justified by any improvement to protection of the public health for this water system. On this basis, **an exception to R309-105-9 Minimum Water Pressure is hereby granted for the single family homes on lots 24-24 and the 15 nest cabins on lot 35.**

This approval pertains to construction only. **An operating permit must be obtained from the Director before the distribution system (DS001) for Summit at Powder Mountain PRUD Phase 1 may be put into service.** A checklist outlining the items required for operating permit issuance is enclosed for your information.

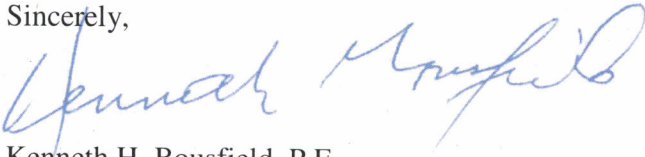
Approvals or permits by local authority or county may be necessary before beginning construction of this project. As the project proceeds, notice of any changes in the approved design, as well as any change affecting the quantity or quality of the delivered water, must be submitted to the Division. We may also conduct interim and final inspections of this project. Please notify us when actual construction begins so that these inspections can be scheduled.

This approval must be renewed if construction has not begun or if substantial equipment has not been ordered within one year of the date of this letter.

Evan D. Miller
Page 4
September 11, 2013

If you have any questions regarding this letter, please contact Bob Hart, of this office, at (801) 536-0054, or Ying-Ying Macauley, Engineering Section Manager, of this office, at (801) 536-4188.

Sincerely,



Kenneth H. Bousfield, P.E.
Director

REH

Enclosure — Operating Permit Checklist

cc: Louis Cooper, Env. Director, Weber-Morgan Health Department, lcooper@co.weber.ut.us
John Reeve, Reeve and Associates, Inc., jreeve@reeve-assoc.com
Sean Wilkinson, Weber County Planner, swilkinson@co.weber.ut.us
Jared Andersen, P.E., Weber County Engineer, jandersen@co.weber.ut.us
Dana Q. Schuler, P.E., Weber County Engineer, dshuler@co.weber.ut.us
Russ Watts, Summit Group, russ@wattsenterprises.co
Jeff Beckman, P.E., Bowen Collins & Associates, Inc., jbeckman@bowencollins.com
Ryan Cathey, P.E., NV5, Inc., ryan.cathey@NV5.com
Bob Hart, Division of Drinking Water, bhart@utah.gov

DDW-2013-009235



State of Utah

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Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

July 23, 2014

Evan D. Miller
Powder Mountain Ski Resort
P.O. Box 270
Eden, Utah 84310

Dear Mr. Miller:

Subject: **PLANS NOT APPROVED**, Revised Pipeline Sizing - Summit at Powder Mountain PRUD Phase 1 (DS001), System #29028, File #9743

On June 25, 2014, the Division of Drinking Water (the Division) received revised plans and specifications for the distribution system at the Summit at Powder Mountain PRUD Phase 1 from your consultant, Ryan Cathey, P.E., of NV5, Inc. The Division had given conditional plan approval to the distribution system in a letter, dated September 11, 2013. This letter approved the installation of an 16-inch distribution water line in the Summit Pass roadway, which will become a county road, to deliver water to four areas in Phase 1 of the Summit at Powder Mountain PRUD. There were five sets of drawings that were submitted:

1. Summit at Powder Mountain Phase 1 – Summit Pass & Spring Park
2. Summit at Powder Mountain Phase 1A – Horizon Run
3. Summit at Powder Mountain Phase 1B – Heartwood Drive
4. Summit at Powder Mountain Phase 1C – Copper Crest Road
5. Summit at Powder Mountain Phase 1D – Meridian Ave., Daybreak Ridge, and Rolling Drive

The water lines in the four areas were mostly 10-inch and 12-inch HDPE pipe. Approximately 30 fire hydrants were to be installed. The water lines were designed based on providing 2000 gpm fire flow. The hydraulic model that was submitted demonstrated the proposed distribution system was capable of supplying peak day demand, 2000 gpm fire flow, and maintaining the minimum required distribution system pressure of 20 psi during fire flow.

Three modified sets of drawings were submitted on June 25, 2014, in the revised pipeline sizing for the Summit at Powder Mountain PRUD Phase 1:

1. Summit Eden Phase 1A (Horizon Run)
2. Summit Eden Phase 1B (Heartwood Drive)
3. Summit Eden Phase 1C (Copper Crest Road)

The Phase 1A drawings originally had a 12-inch HDPE pipeline that then reduced to a 10-inch HDPE pipeline in Horizon Run. The revised June 25, 2014, pipeline sizing drawings for Phase 1A have the entire line reduced to 8-inch HDPE pipe.

The Phase 1B drawings originally had a 12-inch HDPE pipeline in Heartwood Drive that looped back to Summit Pass roadway. The revised June 25, 2014, pipeline sizing drawings for Phase 1B have the line reduced to 8-inch HDPE pipe.

The Phase 1C drawings originally had a 10-inch HDPE pipeline in Copper Crest Road. The revised June 25, 2014, pipeline sizing drawings for Phase 1C have the line reduced to 8-inch HDPE pipe.

No drawings were submitted to revise Phase 1D.

A revised hydraulic model was also submitted on June 25, 2014, but this model was based on supplying 1500 gpm fire flow instead of the originally planned 2000 gpm fire flow. The revised hydraulic model that was submitted demonstrated the distribution system with revised line size to 8-inch HDPE pipe was capable of supplying peak day demand, 1500 gpm fire flow, and maintaining the minimum required distribution system pressure of 20 psi during fire flow, except for one location, junction J-105. J-105 is a fire hydrant at the north end of Horizon Run that will serve 2 single family units. The hydrant at J-105 is only capable of supplying approximately 1,100 gpm fire flow before the pressure falls below the minimum required distribution system pressure of 20 psi during fire flow.

In accordance with the Utah Drinking Water Rules, Utah Administrative Code R309-550-5(5) Water Main Design – Fire Protection, and Rule 309-510-8(3) Storage Sizing – Fire Suppression Storage, the Division of Drinking Water relies on the local fire suppression authority (fire marshal) to determine the fire flow requirements and the flow duration. The State of Utah has adopted the 2012 International Fire Code (IFC), as amended, but leaves up to the local fire district whether or not to adopt Appendix B of this code. Weber County has adopted Appendix B of the 2012 IFC. Appendix B sets the minimum required fire flow and flow duration based on the square footage and type of construction of a building. Appendix B allows the fire chief to increase or decrease the minimum requirements based on local conditions. It is the understanding of the Division of Drinking Water, that Ted Black, who was the Weber County Fire Marshal who reviewed the plans for the Summit at Powder Mountain PRUD Phase 1 development, established the required fire flow to be 2000 gpm, the fire suppression storage to be 250,000 gallons, and that all buildings in the development would have automatic fire sprinkler systems. Further, the current Weber County Fire Marshal, Brandon J. Thueson, has not agreed to any reduction in the required fire flow established by his predecessor. Based upon these circumstances:

Evan Miller
Page 3
July 23, 2014

The Division of Drinking Water does not approve the revised pipeline sizing drawings submitted on June 25, 2014, which reduces the waterlines serving Phase 1A, 1B, and 1C to 8-inch HDPE pipe, because the reduced line sizes are not capable of meeting the required fire flows established by the Weber County Fire Marshal who reviewed the Summit at Powder Mountain PRUD Phase 1 development.

If you have any questions regarding this letter, please contact Bob Hart, of this office, at (801) 536-0054, or Ying-Ying Macauley, Engineering Section Manager, of this office, at (801) 536-4188.

Sincerely,



Kenneth H. Bousfield, P.E.
Director

REH

Enclosure — Operating Permit Checklist

cc: Louis Cooper, Env. Director, Weber-Morgan Health Department, lcooper@co.weber.ut.us
John Reeve, Reeve and Associates Inc., jreeve@reeve-assoc.com
Sean Wilkinson, Weber County Planner, swilkinson@co.weber.ut.us
Jared Andersen, P.E., Weber County Engineer, jandersen@co.weber.ut.us
Dana Q. Schuler, P.E., Weber County Engineer, dshuler@co.weber.ut.us
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Ying-Ying Macauley, Division of Drinking Water, ymacauley@utah.gov
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Brandon J. Thueson, Weber Fire Marshal, bthueson@weberfd.com
Coy Porter, State Fire Marshal, coyporter@utah.gov
Ted Black, Chief Deputy State Fire Marshal, tblack@utah.gov
M.M. Hubbell, Attorney Generals Office, mhubbell@utah.gov

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August 3, 2014

Ryan Cathey
NV5
5217 South State Street, Suite 200
Murray Utah 84107

RE: Fire Flow Requirements

As background for this letter, it must be noted that the developer had previously submitted and had plans approved for the installation of water lines in the project area. The originally approval indicated larger water main sizes in some of the areas. The current discussions regarding fire flow resulted from the desire of the developer to reduce these line sizes from 10 inch lines to 8 inch lines. Plans were submitted to the Utah Division of Drinking Water and to Weber County. However, Weber Fire District did not receive these plans until after petitioning through email for the documents. It was also noted on the plans submitted to the County which indicated changes in road grades that the water lines indicated on the plans differed from those on the previously approved plans.

The developer has indicated that the desire to reduce line sizes is due to the concern of stagnant water in the lines and the overall cost of the larger pipe diameters vs. installing the smaller size. We have pointed out in discussion that there may be other consequences of reducing line size, and we feel that it is important to note that by reducing these lines sizes, the developer may be restricting themselves on future building types and sizes in the project areas affected by these reductions of line sizes.

Over the past few months there has been an ongoing discussion concerning fire flow requirements for the Powder Mountain area project and specifically related to fire flow for what are indicated at this time to be residential areas. Mr. Cathey and I had several email conversations during May regarding the issue however no solid conclusion had been reached.

The difficulty of determining the required fire flow for the project site is that there are no established building plans to work from, and that the developer has not been able to provide exactly what size and type of structures will be built. The 2012 International Fire Code adopted by the State of Utah with amendments, and also adopted by Weber Fire District (including appendix B) is the primary document driving fire flow requirements. Within this document, table

Chief, David L. Austin - Deputy Chief, Paul Sullivan - Fire Marshal, Brandon Thueson

B105.1 established the minimum fire flow requirement and duration for structures of a given type of construction and size of building. Without these two pieces of information, establishing fire flow becomes difficult as it is a projection of what may be built.

In the past two weeks there has been many phone conversations, emails and in person meetings with Ryan Cathey, Rick Everson, Bob Hart with Division of Drinking Water and Weber County Engineering. There has been an expression of confusion as to whether the District had established fire flow standards for the project. The information that the District currently has been provided indicates that the fire flow should be somewhere between 2000gpm and 1500gpm. There is no documentation that the District previously established fire flow for the project.

Weber Fire District has a difficult tactical situation facing it regarding fire suppression in the project area. This area is in a Wildland interface area and the structures are difficult to get to due to the existing access road. Fire apparatus and personnel responding to fire incidents in this area will be highly dependent upon the water system which is being designed and installed. This water supply will be valuable for not only structure fire suppression but for the Wildland fires in the area. History has proven that once people are introduced into an area, the risk for Wildland fires greatly increases. It is the intent of the Weber Fire District to provide the best possible protection for the developer and future residents of the area.

I have carefully researched through the documents submitted to the County for the project, the water flow report submitted to Division of Drinking Water, NFPA documents, the International Fire Code and the 2006 Utah Wildland Interface Code. All available information was considered in my evaluation of the water and fire flow requirements.

With the information that has been provided to me at this time, I have determined that the fire flow for the project will be as follows:

Lots 5R and 6R: According to the modeling report submitted by NV5, all nodes except node J-105 are able to produce at least 1750 gpm, and in many cases more than this. J-105 is a hydrant node which services two lots. These two lots are lot 5R and 6R. The modeling report indicates that there will be 1,107 gpm available at these two locations. Therefore, these two lots shall be restricted to have structures which meet the following requirements for building type and size:

Lots 5R and 6R Fire Flow and Construction Types and Sizes

Construction Type	Type IA and IB	Type IIA and IIIA	Type IV and VA	Type IIB and IIIB	Type VB	Fire Flow (GPM)	Duration (Hours)
Gross Square Footage	0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1100	2

All other areas of the development:

The fire flow in all other areas of the development shall meet the requirements listed in table

B105.1 of the International Fire Code, unless specifically directed otherwise by the Fire Marshal or Fire Chief.

As the development continues, structure design shall take into consideration the available fire flow in the area and shall not exceed the size (gross square footage as outlined in appendix B of the IFC) for the type of construction of the building.

Allowable Reductions and Increases of Fire Flow:

As allowed by the 2012 International Fire Code, Appendix B section B103 "Modifications", the Fire Chief and the Fire Marshal are allowed to increase or allow decreases as outlined in appendix B. Weber Fire District reserves this right as given by the Fire Code.

After carefully considering the plans for the development along with the challenges facing firefighting operations in the area of the development, I have determined that there shall be no overall reduction of fire flow granted in the area of the development. Specific situations, for specific buildings may be addressed on a case by case basis, however as stated above, we reserve the right given by the IFC to grant or reject any petition of a reduction of fire flow.

Documentation:

The developer shall prepare a written correspondence to be signed and recorded as part of the development records with Weber County regarding the restrictions of building type and size as outlined above for lots 5R and 6R.

The developer shall provide a written acknowledgment of fire flow requirements as outlined for all other areas of the development and shall agree to follow the outlined requirements.

Sincerely,



Brandon Thueson
Fire Marshal
Weber Fire District

cc.

Chief David Austin, Weber Fire District
Amy Hugie, Legal Counsel Weber Fire District
Utah State Fire Marshal's Office
Bob Hart, Utah Division of Drinking Water
Weber County Engineering

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m²), used to determine the required fire flow.

SECTION B103 MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code*.

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by *fire walls* without openings, constructed in

accordance with the *International Building Code*, are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings* having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m²) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for *dwellings* having a fire-flow calculation area in excess of 3,600 square feet (344.5 m²) shall not be less than that specified in Table B105.1.

Exception: A reduction in required fire-flow of 50 percent, as *approved*, is allowed when the building is equipped with an *approved automatic sprinkler system*.

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* shall be as specified in Table B105.1.

Exception: A reduction in required fire-flow of up to 75 percent, as *approved*, is allowed when the building is provided with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.

SECTION B106 REFERENCED STANDARDS

ICC	IBC—12	International Building Code	B104.2, Table B105.1
ICC	IWUIC—12	International Wildland-Urban Interface Code	B103.3
NFPA	1142—12	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

**TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS**

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	4
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

FlexTable: Hydrant Table

Current Time: 0.000 hours

Label	Include Lateral Loss?	Lateral Length (ft)	Elevation (ft)	Satisfies Fire Flow Constraints?	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Flow (Total Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Available) (gpm)
H-A1	True	20	8,766	True	0.00	8,894	55	1,500.00	2,474.31	2,474.31
H-A2	True	20	8,745	True	0.00	8,894	64	1,500.00	3,017.52	3,017.52
H-A3	True	20	8,736	True	0.00	8,894	69	1,500.00	3,507.13	3,507.13
H-A4	True	20	8,739	True	0.00	8,894	67	1,500.00	3,507.12	3,507.12
H-A5	True	20	8,744	True	0.00	8,894	65	1,500.00	3,507.12	3,507.12
H-A6	True	20	8,746	True	1.67	8,894	64	1,501.67	3,507.11	3,508.78
H-A7	True	20	8,783	True	0.00	8,894	48	1,500.00	3,507.13	3,507.13
H-B1	True	20	8,774	True	0.00	8,894	52	1,500.00	2,877.39	2,877.39
H-B2	True	20	8,792	True	0.00	8,894	44	1,500.00	3,176.09	3,176.09
H-B3	True	20	8,805	True	4.44	8,894	39	1,504.44	2,765.05	2,769.49
H-C1	True	20	8,608	True	5.00	8,747	60	1,505.00	3,471.06	3,476.06
H-C2	True	20	8,618	True	0.00	8,747	56	1,500.00	2,753.61	2,753.61
H-C3	True	20	8,616	True	0.00	8,747	57	1,500.00	3,148.34	3,148.34
H-C4	True	20	8,569	True	5.56	8,747	77	1,505.56	3,865.94	3,871.50
H-C5	True	20	8,549	True	0.00	8,747	86	1,500.00	3,552.25	3,552.25
H-SP1	True	20	8,769	True	0.00	8,894	54	1,500.00	5,364.27	5,364.27
H-SP2	True	20	8,771	True	0.00	8,894	53	1,500.00	5,074.39	5,074.39
H-SP3	True	20	8,749	True	0.00	8,894	63	1,500.00	5,547.94	5,547.94
H-SP4	True	20	8,700	True	0.00	8,894	84	1,500.00	6,292.37	6,292.37
H-SP5	True	20	8,665	True	0.00	8,894	99	1,500.00	6,669.32	6,669.32
H-SP6	True	20	8,640	True	2.22	8,747	47	1,502.22	5,355.80	5,358.02
H-SP7	True	20	8,626	True	0.00	8,747	52	1,500.00	5,532.43	5,532.43
H-SP8	True	20	8,630	True	0.00	8,747	51	1,500.00	5,157.00	5,157.00
H-SP9	True	20	8,633	True	0.00	8,747	50	1,500.00	4,864.23	4,864.23
H-SP10	True	20	8,636	True	0.00	8,747	48	1,500.00	4,634.57	4,634.57
H-SP11	True	20	8,627	True	0.00	8,747	52	1,500.00	4,848.52	4,848.52
H-SP12	True	20	8,607	True	0.00	8,747	61	1,500.00	5,250.49	5,250.49