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Holy Cross Wilderness Defense Fund

Board of Directors *

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28 June 2020

Leanne Veldhuis, Eagle-Holy Cross District Ranger
PO Box 190
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Re: Plans for exploratory drilling in Homestake Valley in preparation for construction of proposed Whitney Reservoir within the Homestake Valley
(Whitney Creek Geotechnical Investigations)

Dear Ms. Veldhuis:

In my letter of January 30, 2020 to White River National Forest Supervisor Scott Fitzwilliams, I expressed my appreciation of his concern for the fens and other wetlands that exist in the Homestake Valley. Mr. Fitzwilliams stated correctly that they are results of processes that began over 10,000 years ago and that they are irreplaceable. They are collectively a unique ecological treasure that must be protected for the study and enjoyment of all future generations. They have profound intrinsic value quite aside from any human enjoyment. They play vital roles in the preservation of the wilderness ecosystem.

In 1982, I was the organizer and co-founder of the Holy Cross Wilderness Defense Fund. We opposed the Homestake II project planned by Aurora and Colorado Springs, and it has not been built. We continue to oppose this project in any form, and it appears to be unlikely that the Cities can resurrect this destructive project. We will oppose any project that would modify the boundaries of the Holy Cross Wilderness. We will use any legal means available and necessary to prevent this infringement on the Holy Cross Wilderness, and we will alert the public throughout Colorado to this threat to the integrity of the Wilderness. The people of Colorado love this wilderness and have supported our efforts for over forty years to establish it and preserve it. You should not underestimate the intensity of these feelings and the attitudes of the public in this matter.

Since 1948, I have camped in, fished, photographed and enjoyed the Holy Cross area long before it was designated as a federally protected wilderness, and that includes the Homestake Valley, which was grievously and irreversibly damaged by the construction of the Homestake Reservoir.

Enough.

The Homestake Dam would never have been approved under conditions by which Homestake II was rejected. It would have never passed an Environmental Impact Assessment even 40 years ago. It was built at a time when

being an environmentalist meant that you mowed your bluegrass lawn twice a week and put out your cigarette in an ashtray instead of throwing it into the dry weeds by the road. I know. I helped build the Dillon Dam in 1960 running heavy equipment.

We strongly oppose the issuance of any drilling permit to determine the geologic conditions in anticipation of the proposed Whitney Reservoir. The drilling activity, which is described in the comments I read in published articles and in the application submitted by the Homestake Partners on 25 June 2019, is an unacceptably destructive process. It is madness.

Thoroughly documented geologic faults through the proposed dam sites prohibit the construction of any dam in the Homestake Valley and make any test drillings pointless and unnecessary.

We strongly urge that you deny the permit for this drilling, which is predicated on the lunatic possibility of constructing this reservoir.

We oppose the construction of the Whitney Reservoir or anything like it in the Homestake Valley. It is madness.

Seismic activity, active and potential, along the Rio Grande Rift, Sawatch Range and Homestake Valley

The Homestake Valley and surrounding mountains in the Sawatch Range lie at the northern end of the Sawatch Range Fault Zone (Kellogg, et al, 2017). The entire region is seismically active and any dam - including the existing Homestake Reservoir - is a potentially catastrophic, fatal hazard to the downstream communities of Minturn, Red Cliff and others along the Eagle River. A geologic map prepared in 1974 by Ogden Tweto for the US Geological Survey on the basis of thirty years of research appears to show swarms of faults along and crossing the course of Homestake Creek within the Homestake Valley. The Holy Cross Quadrangle geologic map is at <https://pubs.usgs.gov/imap/830/>, https://pubs.usgs.gov/imap/830/downloads/l-830_map.pdf (main geologic map) and the text is at https://pubs.usgs.gov/imap/830/downloads/l-830textonly_508.pdf. The authors note: "Down-to-valley normal faults define the margins of the Arkansas and upper Eagle River valleys."

A more recent map of the Homestake Valley dated April 17, 2020 is at <https://pubs.er.usgs.gov/publication/sim3451> (Ruleman, et al, 2020) and at <https://pubs.usgs.gov/sim/3451/sim3451.pdf>.

These faults are an integral part of the Rio Grande Rift that extends from northern Mexico and New Mexico south of the San Luis Valley to Northern Colorado almost to the Wyoming border. The Rio Grande Rift is well known among geologists as one of the only divergent plate boundary continental rift zones, and it plays an important role in Colorado's geology and geography. (Nakai, et al, 2017; Veatch, 2012; Hicks, 2019). The rift remains seismically active (Berglund, et al, 2012). "The Rio Grande Rift is actively deforming in an evolving tectonic environment" (Murray, et al, 2018). Nakai, et al (2017) recorded over 900 earthquakes in the Rio Grande Rift system exclusive of induced earthquakes and mine blasts, and found that "...the rift is actively deforming both broadly and in distinct regions." "Neogene faults in the northern rift in north central Colorado are seismically active in the North Park Basin and in northwestern Colorado." The Homestake Valley lies between this specific northern zone and the San Luis Valley to the south, which is the most seismically active region (Ruleman, et al, 2016; Ruleman, et al, 2019).

In a memo issued by Vincent Matthews III, former director of Colorado Geological Survey, the author states "It is important in this discussion to remember that Colorado is an active tectonic province that is essentially being pulled apart where the Rio Grande Rift cuts north/south across the mountainous, central part of the state. The high mountains in the state are a result of uplift on faults (with associated earthquakes) that are part of the rift system. Three faults in the state have received sufficient study to be included in the USGS National Seismic (Earthquake) Hazard Map and are listed as being capable of generating earthquakes of 7.0 magnitude, or greater. There are many more faults in the state that could probably generate significant earthquakes, but have not received sufficient study, or documentation, to be included in the hazard map. With our current state of knowledge, it is not possible to predict when or where, the next large earthquake might occur in Colorado"

(Matthews, 2020).

A little over 4,000 years ago, the Dotsero volcano erupted less than 40 miles from the Homestake Valley. In geologic time, that was an instant ago. In terms of the complex fault systems along the corridor of the Rio Grande Rift, it's next door. Just north of Dotsero, there is widespread evidence of recent volcanic activity easily visible from the highway.

Professor Joseph Allen, Chairman of the Department of Geology at Concord University in West Virginia, has conducted geological research in the Homestake Valley for many years. He has identified outcrops of a rare mineral deposit, pseudotachylyte, in the Homestake Shear Zone, within the Homestake Valley and within and immediately adjacent to the Homestake Creek streambed. This mineral reflects surface exposure of extremely deep tectonic shear zone activity that has been brought to the surface and illustrates the degree of uplift within the zone and tectonic boundaries. Not only does this indicate powerful seismic activity right where the proposed Whitney Dam would be located, it is so rare that Professor Allen regularly brings scientific colleagues and students from around the world to view this extraordinary geological phenomenon. He thinks it should be declared a World Heritage Site because of its scientific importance. These rare outcrops would be destroyed and obliterated by moving the Homestake Road in order to build the Whitney Reservoir.

In his research, Allen finds clusters of faults running right down the middle of the Homestake Creek streambed (Allen, 2005; Allen and Shaw, 2013, Fig. 3). The Whitney Reservoir Dam would be built right over these faults. The Homestake Reservoir John Elliot Dam is built right over this same system of faults. A geologic map of Homestake Reservoir shows a fault (The Homestake Shear Zone) underlying the reservoir and running through underneath the dam structure.

https://pubs.usgs.gov/sim/3451/sim3451_georeferenced.pdf

Aside from the innate earthquake potential, dams and reservoirs holding millions of tons of water cause earthquakes by both the pressure of the weight of the water and by "pore pressure," the infiltration of water into the rock under the reservoir which permits pre-existing fault lines to become active. An earthquake happens, the dam breaks and fails, and a catastrophic release of water occurs. This is a well-known phenomenon (Seismology Research Center) called "reservoir-induced seismicity" (RIS) (Schwartz, et al, 1996). In a study of the seismic effects of reservoirs, Mickey (1972) concluded that "...before a reservoir is built, the surrounding area be mapped geologically to detect possible presence of faults, and if they are found, an alternate site should be selected."

Was this done before the Homestake Reservoir was built in the early 1960's? Or was Ogden Tweto's conscientious geological mapping over the previous twenty years ignored?

Should it be a surprise that the Homestake tunnels collapsed in 1974 (Aurora WPR, 2010)? Earthquakes happen.

It is not difficult to imagine, with the increasing amplitude and severity of weather events caused by global warming, a 500-year or 1,000-year precipitation flood event that would overwhelm either the Homestake Reservoir Dam or the Whitney Dam or both that could result in a catastrophic flood that would destroy lives and property in Minturn and communities downstream on the Eagle River. An event like this happened in Boulder, Colorado in 2013. This potential hazard, which would be serious enough without these two dams, cannot be ignored.

The other unpredictable manifestation of rapid global warming is drought. Global warming makes the assumption that there will be enough water in Homestake Creek to fill a new dam highly questionable.

Wetlands and Fens in Homestake Creek

It is obvious that that the wetlands in the lower Homestake Valley and the volume of water flowing through them affect the availability and quality of water for downstream communities in the Eagle River drainage such as Minturn and Avon.

A study of the many wetlands in the White River National Forest by Colorado State University and the Colorado Natural Heritage Program conducted a wetland mapping and fen field survey in 2011 (Malone, et al, 2011). This program studied two fens in the valley walls adjacent to the Homestake Creek streambed but did not study the numerous wetlands and fens within the immediate flood plain of Homestake Creek. Of the 25 selected wetlands within the 2.3 million acres of the WRNR, 39 fens were identified and selected for study. These numbers indicate the rarity of fens with high altitude ecosystems and wetlands.

In a memo concerning the 1999 release of a regional US Fish and Wildlife Service Region 6 study and policy on the protection of peatland mitigation, the regional director stated that fens perform "important hydrological and water quality functions, especially with regard to native trout populations." Because of their importance, sensitivity and unique qualities, fens were placed in the Resource Category 1 as requiring "no loss of existing habitat value." "In other words, because of the irreplaceability of the type of habitat, every reasonable effort should be made to avoid impacting [sic; read "destroying"] that habitat type." Since "...many of the fens of Colorado are over 10,000 years old...", "...such wetlands cannot seriously be considered a renewable resource." "...there are no known reliable methods to create a new, fully functional fen or to restore a severely degraded fen." "Because of their vulnerability, protection of all fens are a priority in this Region" (Hartman, 1999).

In other words, destroying a fen is like taking a sledgehammer, blowtorch and chain saw to irreplaceable works of art, except that in this case, there is no possibility of re-creating the conditions of the late Pleistocene and the past 10,000 years that created the fens (Brugger, et al, 2019; McAlpin, J.P., 2010). They are a world heritage to be protected. These conditions will not happen again.

The White River National Forest Supervisor, Scott Fitzwilliams, has made public statements that reinforce this view and appreciation of wetlands. "This is one of the finest wetlands we can find in our forest - it's unbelievable," he said. "From an environmental impact standpoint, this would not be a project that we would be favorable to." (Gardner-Smith, 2019) "You can mitigate," Fitzwilliams said, "but you can't replace 10,000 years of work." "It's really hard to replace a wetland in these high elevations," said Fitzwilliams (Tory, 2019). Mr. Fitzwilliams' statements appear to reflect an understanding and sincere concern for the preservation and protection of these unique and indispensable components of a sensitive ecosystem. We want to believe that most of the professionals in the US Forest Service in this region such as yourself have this perspective and would prefer to protect the environment rather than destroy it.

In a subsequent conflicting statement that appears to be an example of inexplicable cognitive dissonance, Fitzwilliams is quoted as saying that the use of heavy machinery over newly constructed roads into the Homestake wetlands to conduct the "fatal-flaw" study requiring the boring of 13 holes in the four potential sites of the dam is "pretty straightforward and not overly impactful [sic- a neologism probably meaning "destructive"] (Blevins, 2019). The project includes taking a "track-mounted drill rig or a buggy-mounted drill rig," a "utility vehicle pulling a small trailer" and a "track-mounted skid steer" onto public lands along a 10-foot-wide "temporary access routes." The drill rigs are about 8 feet wide, 22 feet long and 8 feet high. To get the rigs to the drilling sites, some wetlands may need to be crossed and trees will be cut as necessary. (Gardner-Smith 2019)

In other words, Fitzwilliams somehow believes that putting roads through the wetlands and driving tractors and drilling rigs around in them would not destroy them. It boggles the mind. This denial of reality in Fitzwilliams' statement is an example of bureaucratic euphemism concealing colossal and indefensible destruction. It is an enemy of truth, that, in this case, would result in the permanent loss of something that is beautiful, precious, irreplaceable, and a vital part of the natural ecosystem that took tens of thousands of years of ice, biology, and weather to create. These irreplaceable wetlands in the natural ecosystem have spiritual value. They have a

beauty, solitude and essence that humans cannot create. Humans can only destroy them. Let's not.

Even if the Whitney Reservoir dam is not built, and you may be sure we will do everything possible to see that it is not built, the proposed drilling operation would permanently and irreparably damage the wetlands and fens of the section of the Homestake Creek area that is "studied." There would be no recovery. It would be a pointless and indefensible loss.

Nearly 200 acres of these irreplaceable wetlands in the Homestake Valley could be destroyed by the Whitney Reservoir or a similar project (Gardner-Smith, 2019). This estimate, which has high variability, does not account for wetlands downstream from the reservoir that would be deprived of the critical high-water flooding that occurs annually in the natural hydrological cycle. I have personally witnessed the degradation of wetlands in the Homestake Valley since they were functioning in their natural state in 1950 and subsequently deprived of water following construction of the John Elliot Dam for the Homestake Reservoir in 1964. I know what it is like to fish in these streams, to watch and listen to them, and they have been devastated by the Homestake project.

The fact that the cities bought the property that is the site for the proposed reservoir project for \$4 million does not give them the untrammelled right to destroy this key part of the ecosystem in which the public has an important interest. The cities should not only abandon this ill-considered project but consider giving the property to the Nature Conservancy as a good will gesture so it can be protected for future generations. With this, the cities might mitigate somewhat their bad reputation for having destroyed one of the most beautiful places in Colorado and in the world.

Considering the well-documented seismicity of this region, with a major rift zone and fault system running right through the sites under consideration for a reservoir, it is quite obviously foolhardy to consider constructing a dam in this place. The risk of a catastrophic dam failure and hazard to human life is indefensible.

Construction of the Whitney Reservoir requires changing the boundaries of the Holy Cross Wilderness and loss of 500 acres from the Wilderness (Stringer, 2020; Blevins, 2019). This requires an Act of Congress, and aside from the fact that the Congress has a lot of other important things to do, we will oppose this legislation and make certain that every member of Congress knows it and that they will know why we oppose it.

The statement by Marcia Gilles, Acting Eagle-Holy Cross District Ranger, that the USFS would consider only comments about the impact of the proposed drilling is sophistry, it is deceptive, and it is dishonest. It implies that the impact of the drilling must be separated from the impact of the proposed Whitney Creek dam. This amounts to an official lie that does not withstand scrutiny. The two issues cannot be separated. Without plans to build dam, drilling is pointless destruction for the sake of destruction (to show we can do it). Proof of human destructiveness is not necessary

The drilling project must be abandoned. It is based on the utterly false premise that the Whitney Reservoir or some other monstrous edition of it will be built. It will not be built. We will do everything legally necessary and possible to keep it from being built. We will oppose it as long as necessary for the cities of Aurora and Colorado Springs give up and decide to do something reasonable - like water conservation and the abolition of bluegrass lawns, for example.

Keep your drill rigs in the shed.

We are ready to take legal action to stop this destructive drilling project now and we will do so if a permit is granted. We will join other groups in concerted legal action to stop this drilling. We will mobilize public opinion against this indefensible desecration of a treasured part of Colorado's natural beauty. Because of our continuing experience with the frightful momentum of stupid policies, of which Homestake I and now-abandoned Homestake II are prime examples, we know that you are under extreme political pressure from the cities to issue a permit for

drilling. We will begin preparing legal documents for an injunction against the implementation of this permit if you issue it.

Aurora and Colorado Springs made Homestake Lake and upper Homestake Creek, places of unique natural beauty, into sacrifice zones for a drainage ditch to water blue grass lawns and golf courses in those cities. The cities spent millions of dollars on the ill-conceived Homestake II Project to make Cross Creek and its tributaries another sacrifice zone before it was defeated by our grass-roots citizen organization, the Holy Cross Wilderness Defense Fund (Noreen, 1994). The cities now plan to make all of what's left of Homestake Creek into another sacrifice zone for blue grass lawns and car washes in the Eastern Slope cities. This is environmental rape and pillage. We won't stand for it. Stop.

There is no justification for the destruction of the Homestake Valley. My colleague and Vice Chairman of the Holy Cross Wilderness Defense Fund, Professor Jack Holmes, has clearly outlined less destructive alternatives for Aurora and Colorado Springs to obtain the water they need for continued mindless uncontrolled growth including the water rights they hold on water issuing from the Holy Cross Wilderness and Homestake Creek. These alternatives are widely known, and they are described in Professor Holmes' "One solution to numerous water projects" Valley Voices editorial in the Vail Daily published on August 8, 2019. The various complexities and alternatives are also described by Allen Best in the Aspen Daily News in 2016 (Best, 2016).

There is no compromise possible on the issue of the Whitney Reservoir and its requirement to change the boundaries of the Holy Cross Wilderness. All the compromises have been made, and they have all been to the detriment of the wilderness ecosystem, of which the Homestake Valley is a component.

In announcing plans for this drilling in Homestake Valley, officials from the cities of Aurora and Colorado Springs say that they are looking for the "fatal flaw." The "fatal flaw" in this project has two forms: one of them, apparently unknown to or deliberately ignored by the city officials, is shown in the geologic maps that illustrate the major faults that traverse the Homestake Valley. The second "fatal flaw" with the Whitney reservoir project (Homestake III) can be summarized in two words: colossal stupidity.

Sincerely,
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Jennifer Eberlien, Acting Regional Forester
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*Not all board members listed

References

Allen, J.L. 2005. A multi-kilometer pseudotachylyte system as an exhumed record of earthquake rupture geometry at hypocentral depths (Colorado, USA). *Tectonophysics* 402:37-54. DOI: 10.1016/j.tecto.2004.10.017 https://www.researchgate.net/publication/222526933_A_multi-kilometer_pseudotachylyte_system_as_an_exhumed_record_of_earthquake_rupture_geometry_at_hypocentral_depths_Colorado_USA

Allen, J.L. and Shaw, C.A. 2013. Seismogenic fault-zone processes and heterogeneity recorded by pseudotachylyte: New insights from the Homestake shear zone, Colorado. *Geological Society of America Field Guide* 33:165-183. Doi:10.1130/2013.0033(05). https://www.researchgate.net/publication/259643076_Seismogenic_fault-zone_processes_and_heterogeneity_recorded_by_pseudotachylyte_New_insights_from_the_Homestake_shear_zone_Colorado

Aurora Water Public Relations. 2010. Parts of Homestake Tunnel collapse requiring massive repairs. Aurora Water History Timeline. https://www.auroragov.org/UserFiles/Servers/Server_1881137/File/Residents/Water/Water%20System/Aurora%20Water%20Facts/002340.pdf

Best, A. 2016. Choices are narrowing for water development along Eagle River. *Aspen Daily News*, September 25. https://www.aspendailynews.com/choices-are-narrowing-for-water-development-along-eagle-river/article_71630cab-6558-5a13-889f-c7a16cc2e7a4.html

Berglund, H.T., Sheehan, A.F., Murray, M.H., Roy, M., Lowry, A.R., Nerem, R.S. and Blume, F. 2012. Distributed deformation across the Rio Grande Rift, Great Plains, and Colorado Plateau. *Geology* 40(1):23-26. <https://doi.org/10.1002/2016JB013389> https://www.researchgate.net/publication/259465498_Distributed_deformation_across_the_Rio_Grande_Rift_Great_Plains_and_Colorado_Plateau

Blevins, J. 2019. Aurora, Colorado Springs own water near Leadville. They may need to redraw a wilderness area to access it. *The Colorado Sun*, November 21. <https://coloradosun.com/2019/11/21/aurora-colorado-springs-water-holy-cross-wilderness-boundary/>

Brugger, K.A., Ruleman, C.A., Caffee, M.W., and Mason, C.C. 2019. Climate during the Last Glacial Maximum in the Northern Sawatch Range, Colorado, USA. *Quaternary*, 2(4): doi:10.3390/quat2040036 <https://www.mdpi.com/2571-550X/2/4/36>

ESS Earth Sciences. n.d. Dams and Earthquakes. Seismology Research Center Information Sheet pp 1-3. <https://www.src.com.au/earthquakes/seismology-101/dams-earthquakes/>

Hartman, N. 1999. Memorandum: Regional Policy on the Protection of Fens. As Amended. Attached to: Peatland Mitigation Policy Considerations. Ecological Services, Colorado Field Office, Lakewood, Colorado, U.S. Fish and Wildlife Service Region 6. Revised January 1999. January 20. <https://www.fws.gov/mountain-prairie/es/fen/FWSRegion6FenPolicy1999.pdf>

Hicks, E. 2019. Rifts and the Rio Grande Valley. ArcGIS StoryMaps. <https://storymaps.arcgis.com/stories/1b457017b0b7497ab0ac314dbde51114>

Holmes, J. 2019. August 8. One solution to numerous water projects. <https://www.vaildaily.com/news/holmes-one-solution-to-numerous-water-projects>

Kellogg, K.S., Shroba, R.R., Ruleman, C.A., Bohannon, R.G., McIntosh, W.C., Premo, W.R., Cosca, M.A., Moscati, R.J. and Brandt, T.R. 2017. Geologic map of the Upper Arkansas River Valley Region, North-Central Colorado. Pamphlet to accompany Scientific Investigations Map 3382. U.S. Geological Survey: Reston, Virginia. <https://pubs.usgs.gov/sim/3382/sim3382.pdf>

Malone, D., Carlson, E., Smith, G., Culver, D., and Lemly, J. 2011. Wetland Mapping and Fen Survey in the White River National Forest. Colorado Natural Heritage Program, Fort Collins: Colorado State University. http://www.cnhp.colostate.edu/download/documents/2011/WRNF_Wetland_Report_2011_final.pdf

Matthews, V., III. 2003. The challenges of evaluating earthquake hazard in Colorado. Engineering Geology in Colorado - Contributions, Trends and Case Histories, 2003. AEG SP 15 & CGS SP 55. <https://coloradogeologicalsurvey.org/wp-content/uploads/RT-0047076-Matthews-eq-2003.pdf>

McCalpin, J.P. (ed.) 2010. Quaternary Geology and Geochronology of the Uppermost Arkansas Valley, Colorado - Glaciers, Ice Dams, Landslides, and Floods. From the Selected works of James P. McCalpin. Utah State University. Trip Leaders: James P. McCalpin, Jason Briner, Nicolas Young, Eric Leonard, Cal Ruleman. Field Guide No. 6, v. 1.0 (18 Oct 2010). Crestone Science Center. PO Box 837 Crestone, CO 81131. www.geohaz.com/cscintro.htm.
bepress https://works.bepress.com/james_mccalpin/10/

Mickey, W.V. 1972. Seismic effects of reservoirs. The Military Engineer 64(420):248-250. <https://www.jstor.org/stable/44562570>.
<https://www.jstor.org/stable/44562570?seq=1>

Murray, K.D., Murray, M.H., and Sheehan, A.F. 2018. Active Deformation Near the Rio Grande Rift and Colorado Plateau as Inferred from Continuous Global Positioning System Measurements. Journal of Geophysical Research Solid Earth 124(2):2166-2183. <https://doi.org/10.1029/2018JB016626> <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2018JB016626>

Nakai, S.F., Sheehan, A.F., and Bilek, S.L. 2017. Seismicity of the Rocky Mountains and Rio Grande Rift from the EarthScope Transportable Array and CREST temporary seismic networks, 2008-2010. Journal of Geophysical Research: Solid Earth 122: 2173-2192. <https://doi.org/10.1002/2016JB013389>
<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016JB013389>

National Geographic Resource Library, n.d. Rift Valley. 2015
Encyclopedic Entry. June 15. <https://www.nationalgeographic.org/encyclopedia/rift-valley/>

Noreen, B. 1994. Another water project is drowned. High Country News, December 12. <https://www.hcn.org/issues/25/710>.

Ruleman, C.A., Machette, M., Thompson, R.A., Miggins, D.M., Goehring, B.M., and Paces J.B. 2016. Geomorphic evolution of the San Luis Basin and Rio Grande in southern Colorado and northern New Mexico. GSA Field Guide. [https://doi.org/10.1130/2016.0044\(13\)](https://doi.org/10.1130/2016.0044(13)) <https://pubs.er.usgs.gov/publication/70187351>

Ruleman, C.A., Hudson, A.M., Thomson, R.A., Miggins, D.P., Paces, J.P. and Goehring, B.M. 2019. Middle Pleistocene formation of the Rio Grande Gorge, San Luis Valley, south-central Colorado and north-central New

Mexico, USA: Process, timing, and downstream implications. *Quaternary Science Reviews* 223, 1 November, 105846. <https://www.sciencedirect.com/science/article/abs/pii/S0277379119301027?via%3Dihub>
<https://doi.org/10.1016/j.quascirev.2019.07.028>

Ruleman, C.A., Frothingham, M.G., Brandt, T.R., Shaw, C.A., Caffee, M.W., Brugger, K.A., and Goehring, B.M., 2020, Geologic map of the Homestake Reservoir 7.5' quadrangle, Lake, Pitkin, and Eagle Counties, Colorado: U.S. Geological Survey Scientific Investigations Map 3451, scale 1:24,000, <https://doi.org/10.3133/sim3451>.
<https://pubs.usgs.gov/sim/3451/sim3451.pdf>

Schwartz, D.P., Joyner, W.B., Stein, R.S., Brown, R.D., McGarr, A.F., Hickman, S.H., and Bakun, W.H. 1996. Review of seismic-hazard issues associated with the Auburn Dam project, Sierra Nevada foothills, California. U.S. Geological Survey Open File Report 96-0011. Reservoir-Induced Seismicity. Pp1-5.
<https://pubs.usgs.gov/of/1996/of96-011/induced.html>

Stringer, G. June 1, 2020. USFS solicits comments on proposed #Aurora dam near Holy Cross. *Aurora Sentinel*.
<https://sentinelcolorado.com/0trending/forest-service-solicits-comments-on-proposed-aurora-dam-near-holy-cross/>

Tory, S. November 18, 2019. Efforts to relocate an ancient wetland could help determine the fate of a water project on lower Homestake Creek. *Aspen Journalism*.
<https://www.aspenjournalism.org/2019/11/18/efforts-to-relocate-an-ancient-wetland-could-help-determine-the-fate-of-a-water-project-on-lower-homestake-creek/>

Veatch, S.W. 2012. The Rio Grande Rift. *Colorado Earth Science*, Thursday, December 27.
<http://coloradoearthscience.blogspot.com/2012/12/the-rio-grande-rift.html>