

Cryptocurrency Mining in Missoula County

What is Cryptocurrency Mining?

A cryptocurrency is a digital asset designed to work as a medium of exchange that uses cryptography (the computerized encoding and decoding of information) to secure its transactions. The control of cryptocurrencies is decentralized, in contrast to centralized banking systems, and works through a public transaction ledger called a blockchain. Cryptocurrency “mining” is the process of validating cryptocurrency transactions (adding blocks of transactions to the blockchain), for which miners are rewarded with new cryptocurrency. Mining is carried out using high-powered computers that compete to be the first to solve complex mathematical puzzles. Most but not all cryptocurrencies involve mining.

Bitcoin, the first cryptocurrency, was created in 2009. More than a thousand other cryptocurrencies have been created since then, but Bitcoin remains the most widely used.

To control the supply of Bitcoin, the system is set up such that a cryptographic puzzle is solved and a new block of transactions added to the blockchain

approximately every 10 minutes. This means that as more miners join the system, the puzzles get increasingly difficult and require more and more computing power (and therefore more and more electricity) to solve. As a result, the energy consumption of the Bitcoin system is increasing rapidly. The amount of electricity consumed by Bitcoin worldwide could power more than 6 million U.S. households, and has increased by a factor of five in the past year alone.

Processing a single Bitcoin transaction consumes thousands of times more energy than processing a single transaction in another payment system like VISA.

Cryptocurrency Mining in Missoula County

Missoula County is an attractive place for locating cryptocurrency mining operations due to the region’s low electricity rates and cool weather which helps to keep equipment from overheating. Electric utilities that operate in Missoula County report receiving large numbers of inquiries from cryptocurrency mining firms. Two commercial-scale cryptocurrency mining facilities are currently operating in the county, as well as an unknown number of small home-based cryptocurrency mining operations.

Missoula County is concerned about the emergency situation created by the current and potential adverse impacts of cryptocurrency mining on the public health and safety of its residents and is requesting public input on this topic.

Current and potential impacts of cryptocurrency mining operations in Missoula County include:

1. NOISE

Cooling equipment at cryptocurrency mining facilities has the potential to create noise pollution that negatively impacts nearby residents, businesses, and wildlife, and such impacts have already been reported in the county. According to the US Environmental Protection Agency, “Studies have shown that there are direct links between noise and health. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity.”

2. GREENHOUSE GASES

The large and increasing energy consumption of cryptocurrency mining operations results in increased greenhouse gas emissions that cause climate change. The Montana Climate Assessment determined that impacts of climate change in Northwest Montana, including Missoula County, will include reduced snowpack, earlier spring snowmelt, and more frequent and intense droughts and wildfires, and that these impacts will be more severe if global greenhouse gas emissions are not reduced sharply in the near future. Missoula County is already suffering the impacts of climate change especially in the form of more frequent and intense wildfires and wildfire smoke. Objective 4.1 of Missoula County’s 2016 Growth Policy is “Reduce Missoula County’s contribution to climate change.”

3. ELECTRICAL SYSTEM RELIABILITY AND SAFETY

The rapid growth in electricity demand resulting from the construction of cryptocurrency mining operations in the county has the potential to pose a reliability and safety risk to local electric distribution systems, and to impact electric rates for other utility customers.

4. FIRE

The use of specialized computer hardware for cryptocurrency mining in buildings, houses and facilities where the electrical infrastructure is not designed for its high energy loads, and that are not in compliance with applicable building codes, may create a fire safety hazard. There have been

news reports of fires caused by cryptocurrency mining operations in Washington State and elsewhere.

5. E-WASTE

Electronic waste from cryptocurrency mining operations contains heavy metals and carcinogens that have the potential to damage human health, water quality, and air quality if not handled correctly.

Several other local governments in the U.S. have placed temporary restrictions on cryptocurrency mining operations. They include:

- ◆ [City of East Wenatchee, Washington,](#)
- ◆ [City of Leavenworth, Washington,](#)
- ◆ [City of Chelan, Washington,](#)
- ◆ [City of Wenatchee, Washington,](#)
- ◆ [City of Plattsburgh, New York,](#) and
- ◆ [Several municipalities in Quebec, Canada.](#)

In addition, a number of electric utilities have imposed moratoriums or restrictions on cryptocurrency mining, including:

- ◆ [Flathead Electric Cooperative](#) (Montana),
- ◆ [Chelan County Public Utility District](#) (Washington),
- ◆ [Douglas County Public Utility District](#) (Washington), and
- ◆ [Mason County Public Utility District 3](#) (Washington).

Guiding Principles from Missoula County's 2016 Growth Policy (p. 2-2):

- Local government should strive to make decisions that are environmentally sound, fiscally responsible, and supportive of healthy communities over the long term.
- The right to a clean and healthful environment is fundamentally important. Missoula County's natural and cultural resources make this place unique; they should be conserved, enhanced and enjoyed.
- Local government decision-making should consider the impacts of and adaptation to climate change in policy and regulatory decisions.
- Economic measures should focus on long term economic development that is fiscally-responsible and does not unduly compromise quality of life or the natural environment.
- Missoula County will strive to protect public health, safety, and welfare in a fiscally-responsible manner.

From: Burt Caldwell [<mailto:speedycbc@gmail.com>]
Sent: Tuesday, May 29, 2018 7:07 PM
To: David Strohmaier <dstrohmaier@missoulacounty.us>
Subject: Re: Cryptocurrency

Dave, in advance of the June 14th meeting I would like to offer the following suggestion for change on your **Potential Interim Zoning Regulations**.

I suggest not limiting it to only cryptocurrencies such as Bitcoin, but expanding it to include all blockchain processing in all sections of the regs. While cryptocurrency mining is a 24/7 effort, blockchain processing seems to be the coming thing and may become 24/7 for whatever industry adopts it.

It will always be acceptable to allow a waiver if a process is found to be a reasonable use of the technology.

I still haven't gone through the massive amount of info you presented, but am sure that limiting the regulation to a specific use of the technology may result in unintended consequences of other industries using the same technology, producing the same undesirable result.

Burt

From: Webb Harrington [<mailto:webbharrington@yahoo.com>]

Sent: Tuesday, June 05, 2018 8:23 AM

To: Jean Curtiss <jcurtiss@missoulacounty.us>; Nicole Rowley <nrowley@missoulacounty.us>; David Strohmaier <dstrohmaier@missoulacounty.us>

Subject: Cryptocurrency - temporary emergency interim zoning

Dear Missoula County Board of Commissioners:

We have been terribly concerned about the long term negative affects of this industry on the local environment and quality of life. Their reasons for moving into Montana seem to indicate we do not have the protective zoning in place to safe-guard unsuspecting citizens.

We totally appreciate and support your forward thinking and action.

Sincerely,

Webb Harrington
Greg Anderson
4563 Schwenk Court
Missoula, MT 59804
406-531-0400

From: Annie Cathey

Sent: Friday, June 08, 2018 4:41 PM

To: Commissioners <commissioners@missoulacounty.us>; Sarah Bell <sbell@missoulacounty.us>

Subject: Voicemail

Hi Commissioners,

We received a voicemail on Tuesday from Nate Monicure 943 W Riverside to express his support of the temporarily prohibit cryptocurrency mining .

Annie

Annie Cathey

Administrative Assistant

Board of County Commissioners

acathey@missoulacounty.us

(406) 258-3200

From: Sue Malek <senatormalek@gmail.com>

Date: June 11, 2018 at 7:44:13 AM MDT

To: Jean Curtiss <jcurtiss@co.missoula.mt.us>, David Strohmaier <dstrohmaier@missoulacounty.us>, Nicole Rowley <nrowley@co.missoula.mt.us>

Subject: Bitcoin

I am sorry I will have to miss your hearing regarding a moratorium on Bitcoin development in Missoula County. I am in France and have had emergency eye surgery. I am unable to fly for two to three weeks.

As you are aware, I attended the Bitcoin meeting in Bonner and have since done quite a lot of reading about the company in the national press. In addition to the issues at Bonner, this company has caused rate increases for homeowners in Greenland and my understanding is Washington state is now under siege.

The fact that 12,000 servers use as much energy as 11,000 homes is tremendously concerning. A company as large as Bitcoin should have remediation measures in place for noise, electrical system reliability and safety, fire and increases in greenhouse gases and e-waste. Instead their decentralization leads to a lack of accountability on any measure.

A moratorium is the most prudent step. I hope you also can find legal ways to address the concerns of the citizens of Bonner.

Thank you for your work.

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Senator Sue Malek
Senate District 46
1400 Prairie Way
Missoula, MT 59802

Any public comment received after 9:00 am on June 11, 2018 will be available at the following link:

<http://apps.missoulacounty.us/go/cryptocurrencycomments>

Agency Comments

None received as of 9:00 am June 11, 2018. Any agency comment received after this time will be available at the following link:

<http://apps.missoulacounty.us/go/cryptocurrencycomments>

Links and Resources

To provide a better understanding of this new and emerging topic, we have compiled a sampling of news articles to inform the public about local, regional, and international press coverage.

Explore these links to learn more about issues related to cryptocurrency mining.

CRYPTOCURRENCY: A SAMPLING OF NEWS ARTICLES

Press Coverage of Cryptocurrency Mining in Montana

[The Bitcoin Barons: How a marketer and a money launderer sold Missoula on digital gold](#) (Missoula Independent, 1/25/18)

[Why the Bitcoin gold rush is moving to Montana](#) (Inc., 1/26/18)

[Bonner Bitcoin data center noise a continuing concern](#) (Missouliaian, 2/3/18)

[CryptoWatt Bitcoin mining operation up and running south of Butte](#) (Montana Standard, 3/16/18)

[Bitcoin under the Big Sky](#) (Flathead Beacon, 3/21/18)

[Mining electricity: Montana bitcoin miners footing big bills](#) (Missouliaian, 3/26/18)

[Bonner property owners make \\$135K TIF request to quiet bitcoin noise](#) (Missoula Independent, 5/22/18)

[After heated meeting, development board denies TIF funding to reduce Bonner bitcoin noise](#) (Missouliaian, 5/24/18)

Press Coverage of Cryptocurrency Mining in the U.S. and Canada

[Bitcoin miners are flocking to Oregon for cheap electricity. Should we give them a boost?](#) (Willamette Week, 2/21/18)

[The rise of Bitcoin factories: Mining for the masses](#) (Wall Street Journal, 2/21/18)

[This is what happens when Bitcoin miners take over your town](#) (Politico Magazine, March/April 2018)

[Small towns try to tame the Bitcoin boom](#) (CityLab, 3/27/18)

[Hydro-Quebec strikes measured approach to Bitcoin mining](#) (Forbes, 3/28/18)

[Washington cities, counties dial back Bitcoin enthusiasm](#) (Government Technology, 3/29/18)

[Tiny towns, small states bet on Bitcoin even as some shun its miners](#) (Pew Trusts, 4/6/18)

[Washington utility boosts security after Bitcoin mining moratorium](#) (Government Technology, 5/3/18)

[Washington utility will uphold its cryptocurrency mining moratorium](#) (Government Technology, 5/15/18)

Press Coverage of Fires at Cryptocurrency Mining Facilities

[This is what happens when Bitcoin miners take over your town](#) (Politico Magazine, March/April 2018)

[Illegal bitcoin mining thought to be behind blaze that engulfed 3 buildings in Turkey's Kocaeli province](#) (Daily Sabah, 4/16/18)

[This is what happens when a Bitcoin mine burns down](#) (Popular Mechanics, 11/10/14)

[Bitcoin mining believed to be behind huge fire in block of flats](#) (Metro, 2/9/18)

Other Resources

[Bitcoin Energy Consumption Index](#) (Digiconomist)

[The Essence of how Bitcoin works \(non-technical\)](#) (YouTube video)

Cryptocurrency Mining: Potential Interim Zoning Regulations

After receiving public input, the County Commissioners may consider the option to implement interim zoning that would temporarily prohibit cryptocurrency mining operations county-wide, within the unincorporated portions of the county, for a period of one year to allow the county time to investigate and address the impacts of cryptocurrency mining operations. Existing cryptocurrency mining operations would be exempt from the prohibition but would not be permitted to expand.

The following language is an example of amendments to the County Zoning Regulations that the Commissioners may consider.

Amendment 1. The following definition added to **SECTION 1.04 DEFINITIONS**.

19. Cryptocurrency Mining

The operation of specialized computer equipment for the purpose of mining one or more blockchain-based cryptocurrencies, such as Bitcoin. This activity typically involves the solving of algorithms as part of the development and maintenance of a blockchain which is a type of distributed ledger maintained on a peer-to-peer network. Typical physical characteristics of cryptocurrency mining include specialized computer hardware for mining operations as well as equipment to cool the hardware and operating space. For the purposes of the associated regulations, cryptocurrency mining does not include the exchange of cryptocurrency or any other type of virtual currency nor does it encompass the use, creation, or maintenance of all types of peer-to-peer distributed ledgers.

Amendment 2. The following new **SECTION 2.21** added.

SECTION 2.21 CRYPTOCURRENCY MINING RESTRICTION ZONE

A. Intent

This section restricts cryptocurrency mining operations in Missoula County in order to protect the public health, safety, and welfare of county residents. Cooling equipment at cryptocurrency mining facilities has the potential to create noise pollution that negatively impacts nearby residents, businesses, and wildlife, and such impacts have already been reported in the county. The high energy consumption of cryptocurrency mining operations runs counter to Missoula County's objective to reduce its contribution to climate change. In addition, cryptocurrency mining has the potential to pose a reliability and safety risk to local electric distribution systems and may create a

fire safety hazard, and the electronic waste from cryptocurrency mining operations contains heavy metals and carcinogens that have the potential to damage human health, water quality, and air quality if not handled correctly.

B. Applicability

All land under jurisdiction of Missoula County, excluding incorporated portions of the county.

C. Prohibition of Cryptocurrency Mining

There is hereby established a zoning district whose boundaries are the boundaries of Missoula County in which a person may not construct or operate a cryptocurrency mining operation either as a primary or an accessory use.

D. Nonconforming Uses

Existing cryptocurrency mining operations shall be subject to Chapter 7 “Nonconformities,” except that no existing cryptocurrency mining operation shall be expanded in area or intensity of use. Equipment or structures deemed necessary for mitigating impacts of such mining operation may be permitted, subject to Zoning Officer approval.

Amendment 3. SECTION 4.03(F)(5)(k) amended to read:

k. The following uses are expressly prohibited as home occupations:

- i. any type of repair or assembly of vehicles or equipment with internal combustion engines (such as autos, motorcycles, scooters, snowmobiles, outboard marine engines, lawn mowers, chain saws, and other small engines) or of large appliances (such as washing machines, dryers, and refrigerators) or any other work related to automobiles and their parts;
- ii. dispatch centers or other businesses where employees come to the site and are dispatched to other locations;
- iii. rental businesses;
- iv. tow truck services;
- v. material or equipment storage businesses;
- vi. restaurants;
- vii. funeral or interment services; ~~and~~;
- viii. animal boarding businesses; and;
- ix. cryptocurrency mining operations.