

**MARION TOWNSHIP PLANNING COMMISSION
AGENDA**

REGULAR MEETING

January 24, 2023

7:30 PM

Virtual access instructions to participate in the meeting are posted on www.mariontownship.com

Call to Order:

Pledge of Allegiance:

Introduction of Members:

Approval of Agenda for: January 24, 2023 Regular Meeting

Approval of Minutes from: December 20, 2022 Regular Meeting

Call to the Public:

Public Hearing:

New Business:

1)

Unfinished Business:

1) TXT#04-22 continue PDR ordinance discussion

2) review spreadsheet and determine work plan for 2023

Special Orders:

1) Budget review for invoices

Announcements:

1) Handout from Bruce on Crypto Mine

Call to the Public:

Adjournment

DRAFT

*Approved by: _____

Larry Grunn, *Chairperson*

Date: _____

**MARION TOWNSHIP
PLANNING COMMISSION
REGULAR MEETING
DECEMBER 20, 2022 - 7:30PM**

PC MEMBERS PRESENT: LARRY GRUNN - *CHAIRPERSON*
JIM ANDERSON - *VICE CHAIRPERSON*
CHERYL RANGE - *SECRETARY*
BOB HANVEY
BRUCE POWELSON

MEMBERS ABSENT: NONE

OTHERS PRESENT: DAVID HAMANN - *MARION TWP. ZONING ADMINISTRATOR*
ZACK MICHELS - *PLANNER W/ CARLISLE WORTMAN*
ALISSA STARLING - *PLANNER W/ CARLISLE WORTMAN*

CALL TO ORDER

Larry Grunn called the meeting to order at 7:30 pm.

APPROVAL OF AGENDA

Bruce Powelson made a motion to approve the December 20, 2022 agenda as presented. Jim Andersen seconded. **MOTION CARRIED**

APPROVAL OF MINUTES

Cheryl Range made a motion to approve the November 22, 2022 Planning Commission minutes. Jim Anderson seconded. **MOTION CARRIED**

CALL TO THE PUBLIC

None.

PUBLIC HEARING:

TXT #01-21 KENNELS SECTION 17.19, 3.02, 6.02, SECTION 8 DISTRICTS

No comment made.

DRAFT

PUBLIC HEARING:

TXT #03-22 SECTION 14 CORRECT LANGUAGE RELATING TO RESIDENTIAL

No comment made.

NEW BUSINESS:

MITCH HARRIS BUILDING PRE-APPLICATION REZONING DISCUSSION

Pat Keough stated that he would like to discuss the 90-acre property west of D19, north of The Meadows and east of Peavy Estates. Currently this property is zoned as Highway Service and he would like to request that this property be rezoned as Urban Residential. Pat is looking for feedback regarding the rezoning.

Larry Grunn expressed his concerns about the increased traffic.

Bob Hanvey asked if they had a timeline. Pat stated that they would like to start building Spring 2024.

Jim Anderson is concerned about the traffic going onto D19, because it is already a very busy area, so after adding these apartments, it is only going to increase the traffic in this area.

Zach Michels stated that the Master Plan that was just adopted

Here are some things to think about when you are looking to make a recommendation for rezoning:

Has anything changed in the area since the previous rezoning was adopted?

What impact will this have on the public services in the area, such as the capacity in the public schools nearby, are there adequate streets to accommodate the increased traffic, are the emergency services able to handle the increased population, etc.?

Does the rezoning adversely affect the environmental conditions or the value of the surrounding property?

Does the rezoning comply with the Townships most recently adopted Master Plan?

Can the property in question be put to reasonable economic use in the zoning district in which it is presently located?

Bob asked if there are plans for a clubhouse or any other recreational things on this site? Pat Keough stated, not at this time.

Bob asked if the space behind the hotel would remain open space. Pat stated that this area is mostly wetlands, so it would remain open space.

Bob asked how many units will they be building? Larry Grunn stated that they are proposing 120 condos and 140 apartments.

DRAFT

UNFINISHED BUSINESS:

REVIEW TXT #02-22 SOLAR FEEDBACK FROM LCPD & ATTORNEY AND FORWARD TO BOT WITH RECOMMENDATION

Zach reviewed the comments from the County and the Attorney. The Farmland Preservation Program is referred to Public Act 116 and the State says that there are certain things that you have to do in order to preserve your tax deduction status. So we wanted to reference that in the language.

The County stated that we did not have a definition for a Photovoltaic Array, so that was added into the language. We also added some language defining what a solar energy system is.

On page 3 under solar farm overlay district, we tried to state that this is designed keep the farmland and that this is to supplement farmland and not overpower it.

A small change was made to the type of access drive allowed to give us some flexibility. There were some minor changes made to page 4, that were recommended by the attorney.

Larry Grunn stated that under the Buffering section on page 5, numbers 5 & 6 seem repetitive. Alyssa said they would take out number 5.

Performance Standards, some changes were made about fencing, buffering and screening, concrete foundations, flexibility on the access points gates.

Bob Hanvey asked if we could add language requiring approval from the Fire Authority in relation to access point gates. Zach said that he would add language for this.

There are some big changes made to page 7 regarding ground cover. Part of Public Act 116, the State has requirements such as healthy vegetation surrounding the solar panels, general liability insurance, application requirements and certification.

On page 10, we added language that gives more authority to the Township regarding decommissioning.

Cheryl Range made motion to recommend approval for TXT #02-22 Solar Energy Zoning Ordinance with the recommendations from the Livingston County Planning Department, to the Board of Trustees. Jim Anderson seconded. **MOTION CARRIED**

REVIEW TXT #01-21 KENNELS AND FORWARD TO LCPD FOR REVIEW AND COMMENT

Jim Anderson made a motion to send TXT #01-21 Kennels to the Livingston County Planning Department for review and comment. Bruce Powelson seconded. **MOTION CARRIED**

REVIEW TXT #03-22 SECTION 14 EXCLUDE RESIDENTIAL AND FORWARD TO LCPD FOR REVIEW AND COMMENT

Jim Anderson made a motion to send TXT #03-22 Section 14 Exclude Residential to the Livingston County Planning Department for review and comment. Larry Grunn seconded. **MOTION CARRIED**

BUDGET REVIEW

Commissioners agreed to postpone the budget review until the next Planning Commission meeting, so they have a full six months of expenses to review.

DRAFT

TXT #04-22 CONTINUE PDR ORDINANCE DISCUSSION

Zach collected some language from other Townships. Zach likes to involve the citizens and create a separate entity/committee that helps regulate this ordinance. Jim Anderson likes the "point system" process, based on each piece of property. Jim thinks we should have 3-4 applicants to help with the deciding process.

Zach recommended having five members along with a couple of alternates.

Zach said that he will put together some language to review at the next meeting

Dave asked if this was going to be a General Ordinance? Zach said that this would be a General Ordinance.

CALL TO THE PUBLIC

Catherine Dyer resides at 2715 High Meadows and commented on the Solar Farm ordinance that the Township has been working on.

Les Andersen expressed some concerns and made some suggestions about change of ownership and/or a change of lease, involving solar farms.

Dave explained that Solar Farms will be treated as a Special-Use which means any time there is a change of ownership, or change in performance, a review will come back to the Board of Trustees for review and approval.

ADJOURNMENT

Bruce Powelson made a motion to adjourn the meeting at 9:20pm. Cheryl Range seconded. **MOTION CARRIED**

ZONING ORDINANCE TEXT AMENDMENTS

CASE #	ARTICLE	SECTION	STATUS	PROPOSED CHANGE	PH Public Hear	ADOPTED Adopted
TXT # TBD	XVII	17.33	Ag/Tour	On hold but needs rework		
TXT #04-17	X	10.01B16 8.01B3 Definitions	Landscape Contractor's Operation contract C/W	LI district rqst Board chg Plant Nursery, RTF Nursery Only	2/27/18 10/22/19	2/28/20
TXT #05-17	XVII	17.34 9.01D.11 Definitions	Outside Vehicle Storage contract C/W	SU 17.34 rqst (Board) HS district	2/27/18	10/25/19
TXT # 06-17	VI	6.07 6.22	Accessory Structures LCBD	roof pitch for AG engineered structures +calculation no bldg code, zoning issue	4/18/18 4/18/18	6/30/18 6/30/18
GO #01-17	GO	G11-97	Land Div GO	revise with 6.19B,6.15A	N/R	
GO #02-17	GO	tbd	Nuisance	rqst(Board)	BOT	1/12/20
GO #03-17	GO	tbd	Noise	rqst(Board)	BOT	Nuisance GO
GO #04-17	GO	tbd	Motor Braking GO	rqst(Board) send to Board(10/24/17)	BOT	Nuisance GO
GO #	GO	tbd	combine Lake & Boat GO Cemetery GO Park & Rec	cover all lakes add fines for vandalism still needed? Add moral conduct	N/R N/R N/R	
TXT #07-17	III	Definitions 6.11 18.02 Splits	Lots per Parent Parcel Land Balancing/clearing nonconforming Acc Structure	in 10/24/17 packet in 10/24/17 packet in 10/24/17 packet in 10/24/17 packet	discuss	ongoing
TXT #	VI	6.14	Home Occupation Class I	add application in first paragraph	dropped	

ZONING ORDINANCE TEXT AMENDMENTS

CASE #	ARTICLE	SECTION	STATUS	PROPOSED CHANGE	PH Public Hear	ADOPTED Adopted
TXT #01-18	VI	6.19/6.20	Private Roads	Length, # of ingress/egress, # driveways, shared driveways, move to Eng Stds	BOT in STD	
TXT #02-18	XVII	17.04A & B	Automobile Repair Garage	Item #8 remove	LCPD	2/8/19
TXT #03-18	XVII	17.32 & 6.14	Home Occupation II & I	proposed to BOT 7-11-2019 sent to LCPD 10/16/2019 , BOT 11/14/2019	8/27/19	3/13/20
TXT #04-18	XVIII	18	Site Plan Requirements	move to Eng Stds and make all other changes	BOT	7/1/20
TXT #	VI	6.32	Solar Ordinance	Zoning Ordinance/GO/both or accessory structure?	Dropped	
TXT #	VI	6.02	Keeping of Animals	RTFA, what is enforceable? Setbacks only?	?	
TXT#01-19	XVII	17.xx	Short Term Rentals	beat to death, add definition and add to RR/SR UBW	11/1/20	Pending
TXT#02-19	XV	15.5,6	Signs for HO	cng to Home Based Business	11/1/20	Pending
TXT#01-20	XVIII	18	Site Plan cleanup	Section 6 and 18 changes	11/1/20	Pending
TXT#02-20	VI	6.07	Accessory Structures	Shipping Containers	11/1/20	Pending
TXT#03-20	XIII	13.04	PUD	move procedure to Standards	12/6/20	Pending
TXT#01-21	XVII,VI,+	17.19a,b, 6.2	Hobby Kennel dogs permitting	WIP	12/20/2022	

**ZONING ORDINANCE
TEXT AMENDMENTS**

CASE #	ARTICLE	SECTION	STATUS	PROPOSED CHANGE	PH	ADOPTED	
	CASE #	ARTICLE	SECTION	STATUS	PROPOSED CHANGE	PH	ADOPTED
TXT#01-22	IV	4.04	Penalty Provisions	Attorney Proposed ticketing Planner reviewed			
TXT#02-22	XVII	17.34	Solar Ordinance	address farms and private	10/25/2022		
TXT#03-22	XIV	14	Off Street Parking and Loading	clarify residential intent	12/20/2022		
GO#01-23			PDR				

701-000 • PLANNING COMMISSION

701-702 • SALARIES	5,005.00	10,000.00	-4,995.00	50.1%
701-705 • RECORDING SECRETARY	1,357.50	1,500.00	-142.50	90.5%
701-750 • SUPPLIES	33.00	150.00	-117.00	22.0%
701-765 • LUNCH STIPEND	0.00	100.00	-100.00	0.0%
701-801 • ATTORNEY	337.05	0.00	337.05	100.0%
701-804 • PLANNER	7,440.00	6,000.00	1,440.00	124.0%
701-805 • ENGINEER	0.00	0.00	0.00	0.0%
701-806 • PROFESS SERV - PREAPPLICATION	0.00	0.00	0.00	0.0%
701-860 • MILEAGE	0.00	75.00	-75.00	0.0%
701-900 • PRINTING & PUB.	57.50	150.00	-92.50	38.3%
701-905 • MASTER PLAN 2005	0.00	0.00	0.00	0.0%
701-910 • TRAINING FOR PLANNING COMMIS...	45.00	1,000.00	-955.00	4.5%
701-955 • MISCELLANEOUS	0.00	0.00	0.00	0.0%
701-956 • MASTERPLAN 2018	1,262.50	1,500.00	-237.50	84.2%
701-000 • PLANNING COMMISSION - Other	0.00	0.00	0.00	0.0%
Total 701-000 • PLANNING COMMISSION	15,537.55	20,475.00	-4,937.45	75.9%

Marion Township Planning Commission Proposed Budget for 2022-2023

	2022-4 Months		2022-2023 Annualized	Proposed Budget
Salaries	\$ 3,575	30.6%	\$ 10,725	\$ 12,253
Recording Secretary	\$ 978	8.4%	\$ 2,933	\$ 3,350
Supplies	\$ 33	0.3%	\$ 99	\$ 113
Lunch Stipend	\$ -	0.0%	\$ -	\$ -
Attorney	\$ 80	0.7%	\$ 241	\$ 275
Planner	\$ 5,640	48.3%	\$ 16,920	\$ 19,331
Engineer	\$ -	0.0%	\$ -	\$ -
Prfess Serv-Preapplication	\$ -	0.0%	\$ -	\$ -
Mileage	\$ -	0.0%	\$ -	\$ -
Printing & Pub.	\$ 58	0.5%	\$ 173	\$ 197
Master Plan 2005	\$ -	0.0%	\$ -	\$ -
Training for Planning Commission	\$ 45	0.4%	\$ 135	\$ 154
Miscellaneous	\$ -	0.0%	\$ -	\$ -
Master Plan 2018	\$ 1,262	10.8%	\$ 3,786	\$ 4,326
Planning Commission Other	\$ -	0.0%	\$ -	\$ -
Totals	\$ 11,670	100%	\$ 35,011	\$ 40,000



Carlisle | Wortman
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

INVOICE

Tammy Beal, Clerk
Marion Township
2877 West Coon Lake Road
Howell, MI 48843

Invoice No. 2167737
Client No.: 266
Date: 01/12/23
Period End: 12/31/2022

General Consultation

12/20/2022	ZM	Preparing for Planning Commission meeting: Solar Kennel	0.50 @	95.00/hr	=	47.50
	AS	Prep for PC meeting	0.50 @	90.00/hr	=	45.00
	AS	NIGHT MEETING (1) - Planning Commission meeting attendance.	3.00 @	90.00/hr	=	270.00
12/21/2022	ZM	Reviewing solar text amendment and purchase of development rights ordinance with AS	0.50 @	95.00/hr	=	47.50

AMOUNT DUE THIS INVOICE:

\$410.00

701-804-GERARD, PC, PLANNED

Robert W. Lanney



Carlisle | Wortman
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

INVOICE

Tammy Beal, Clerk
Marion Township
2877 West Coon Lake Road
Howell, MI 48843

Invoice No. 2167738
Client No.: 266
Date: 01/12/23
Period End: 12/31/2022

Solar Energy

12/12/2022 ZM Revisions to draft text based on
Township attorney comments 0.50 @ 95.00/hr = 47.50

AMOUNT DUE THIS INVOICE:

\$47.50

701-804 GEN FUND, P C, PLANNED

Robert W. Hanvey

THE UNRELENTING ROAR

This is a potentially serious problem. I would prefer to have Crypto banks prohibited in Marion Township. Would like this subject on the agenda for our January Planning Commission meeting.
Bruce

TORE THIS TOWN

By Wudan Yan • Photography by Juan Diego Reyes

Cryptocurrency
aims to revolutionize
finance, but its
mines are destroying
communities
across America.

OF A CRYPTO MINE

APART



It was nearly midnight in late April when Lynell Morris's husband, Michael, returned home after a shift at work.

As he fumbled his keys, the motion-sensing light on their front doorstep flicked on. His eye caught a glint of gold: a .22 bullet on his doormat. It seemed odd as he and Lynell own a different-caliber firearm. Nevertheless, he brought it inside and set it on their kitchen table.

A few days later, he remembered to ask Lynell about it. Immediately, she yelped, "Politics!"

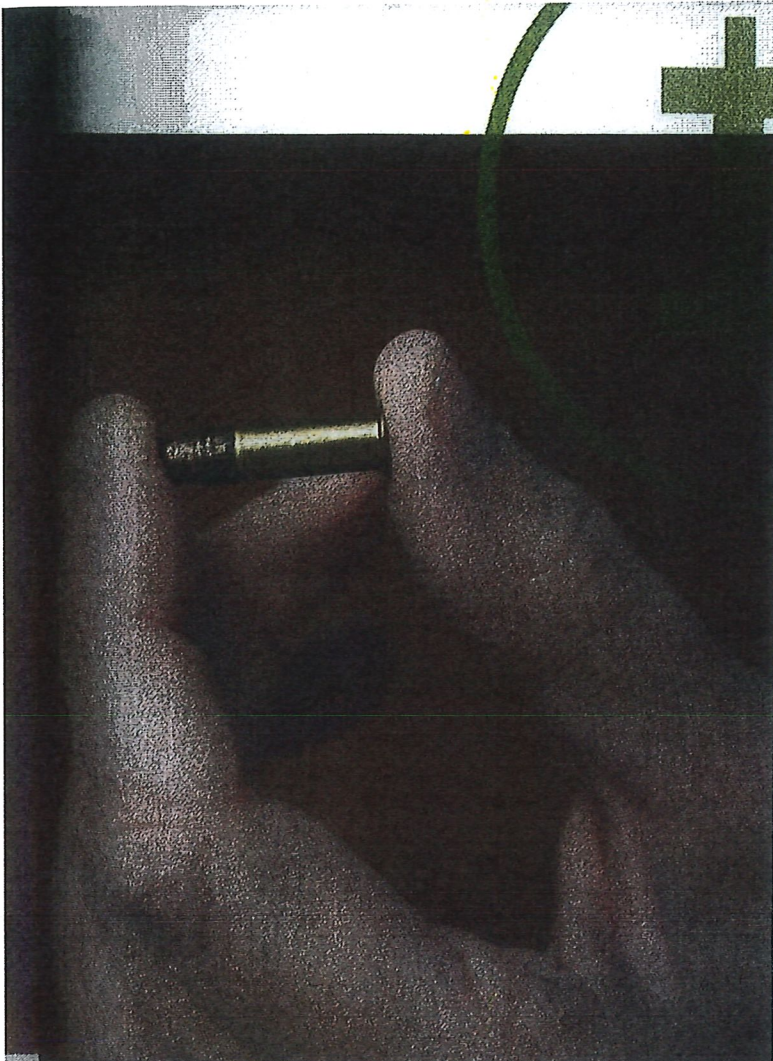
Neither Lynell nor Michael is running for office. But over the last few months, Lynell had become enmeshed in local politics after a cryptocurrency mine set up shop in their town of Murphy, North Carolina, in September 2021. "Mine" is a misnomer, as these facilities are clusters of computing units, solving complex problems to help transact and generate virtual currency, with large—and noisy—fans to cool them.

Sitting in the foothills of the Appalachian and Blue Ridge Mountains, Murphy is a lush oasis promising an uninterrupted soundtrack of nature, and attracting those who value that quiet. Within weeks of when the mine began running, angry residents started complaining about the incessant noise on Facebook and Nextdoor. They likened this new, pervasive sound to a highway, a jet engine on the runway, or a semi idling in their driveway, and said it was disrupting their sleep and eroding their sense of peace.

The Morrisses are lucky. They only hear the mine from their home

when there's no other noise outside. But Lynell was frustrated by her neighbors' stories and began speaking out on their behalf at bimonthly county commissioner meetings. "I take up for the underdogs," she says. Lynell has always been a leader. Before moving to Murphy three years ago with the intent to retire there, she ran a small business with her husband. And, as she puts it: "I was blessed with a mouth."

Lynell ran her mouth on April 18, at the Cherokee County (Murphy is the county seat) board of commissioners meeting. More than six months had passed since the mine began causing a disturbance, and she was fed up with the lack of transparency from her elected officials, who had yet to act upon the concerns of their citizens. Residents have three minutes to make a statement during the public comment period at these meetings. Lynell took the podium and spoke for more than 20 minutes, pressing the commissioners on why they're backing the mine and what they're planning to do to mitigate the noise.



PREVIOUS SPREAD: The south-facing view from Harshaw Road. The cryptocurrency mine is a few hundred yards to the north. **LEFT/ABOVE:** Murphy resident Lynell Morris and the bullet found on her front step.

After the bullet appeared on her doorstep, she wondered if she had said too much. "I'm a Southern girl. I don't scare easily," she says. "It was a threat, nevertheless."

► THE SOUND OF CRYPTOCURRENCY

Follow Highway 64—or as the residents call it, the four-lane—east from town for about three miles. Turn right on Harshaw Place and left on Harshaw Road at the stop sign. Drive parallel to the highway for about half a mile, and you'll see it on your left: large white boxes housing blue containers in a cornfield, partially surrounded by a gray wall. It looks out of place in western North Carolina, something so modern.

As you approach the mine, which is owned by the San Francisco-based firm PrimeBlock, you begin to hear the roar. During the day, its low-frequency hum—which, directly outside, may go up to 95 decibels—can make it seem like you're next to a running motorcycle.

From the mine, roads weave like a spider's web. Harshaw Road continues east. Back at the stop sign, Mulkey Place goes straight. The two are bisected by Club House Road, which then turns into Poor House Mountain Trail. All the streets wind with hairpin turns up into the lush hills, splitting into side streets. Many houses off Harshaw, Mulkey, and Poor House Mountain surround what used to be the

18-hole Cherokee Hills Golf and Country Club, which closed at the end of 2016.

Sound travels in waves and tends to travel farthest in open landscapes. And low-frequency sounds, like the rumble from the crypto mine, travel farther than high-frequency sounds (think: a scream, or nails on a chalkboard) because the longer waves of a low-frequency noise cover more ground before losing energy. In Murphy, residents who can hear the indelible hum most prominently live near an unobstructed path from it. During winter, the noise gets worse without leaves on trees to help absorb the sound. But year-round, residents living up to a mile away from the mine can hear it.

In December, Lynell and fellow resident Cyndie Roberson started a private Facebook group for people to share their experiences and grievances. In a town of about 1,855 people, up to 800 families live within a mile of the mine.

Many residents have installed apps on their phone to track the sound levels. It's so loud that Gene Johnson, whose ears were damaged during his stint in the military and who now wears hearing aids, can still hear the low rumble when the aids come out. He lives on Beaver Ridge Trail, which breaks off Harshaw immediately after you pass the mine. It's so loud that Mike and Jennifer Lugiewicz, who lived two houses down from the mine, could watch but not hear their neighbor mow their lawn. (They have since moved to be farther from the mine.) The din can hide the sound of cars, so now Shannon Coleman helps her mom, who lives a half mile past the mine on Harshaw, retrieve the mail from her box across the street on a blind turn. Her mother, who is legally blind, can't discern the sound of an oncoming car from the sound of the mine, and fears getting hit.

The noise, residents say, is especially terrible at night and early in the morning, when it wakes them up. Some say it's caused them to become depressed and anxious. They've been showing up, as Lynell has, to county commissioners meetings bedraggled, frustrated, and angry that their elected officials have done very little to protect their health.

Patricia Callahan lives in the townhouses on Club House Road. Her unit is the closest to the mine, about a quarter mile away as the crow flies.

Callahan moved to Murphy three years ago, after completing a work-study program at the John Campbell Folk School, an artisan school for adults just outside Murphy, in Brasstown. Her youngest had just left for college, and Callahan was looking for a spot where she could retire. She was taken by Murphy's art scene, but more importantly, the tranquility, and decided to buy in Murphy. After her real estate agent showed her the townhouse, Callahan sat outside at its picnic table and thought, "I have found my peace and quiet."

Those qualities were crucial for Callahan. A car

accident 15 years ago left her with a brain injury, post-traumatic stress disorder, and depression. "I arranged my life to keep my stress low," she said. "My whole body will go into a hypervigilant fight-or-flight mode when I'm around too much noise."

When the mine came online last fall, Callahan's way of life was upended. She used to open the windows at night to cool her bedroom (she prefers not to use air conditioning because she lives on a strict budget), but she must close her windows now to lower the noise. Even that, along with wearing noise-canceling headphones, is not enough. The only time she's been able to get a good night's sleep is when she's in a hotel or camping.

The noise is a constant, Callahan says. "It's more than just my hearing. It affects my whole body, triggering PTSD symptoms," she says. Many older residents with underlying health issues who have retired in Murphy express a similar sentiment: The noise and sleep interruptions caused by the mine are making their conditions worse.

Callahan says she can't sell her house to move somewhere quieter. "Nothing is within my budget," she says. "I'm trapped here."

► MINING NEW MONEY

Cryptocurrency is a digital form of currency that can be used like cash or a credit card. Unlike the U.S. dollar, there is no central authority that prints more coins, or maintains the value of a cryptocurrency. This lack of oversight and regulation is appealing to many who wish to grow their wealth without traditional banking institutions.

Bitcoin became the first viable cryptocurrency in 2009, and over the last 13 years, demand for cryptocurrencies has only skyrocketed. Now, there are more than 10,000 cryptocurrencies valued around \$1 trillion in total, and a 2021 Pew Research study found that one in six Americans use them. "There is a general movement of making finance more for the people," Matteo Benneton, PhD, an assistant professor of finance at University of California, Berkeley, says of cryptocurrency's appeal.

Cryptocurrency mining is computers solving complex algorithms to record crypto transactions that prevent people from spending their currency more than once. After a certain amount of work, a mine is paid in newly created cryptocurrency. This computing relies on an astronomical amount of power. The Murphy mine, according to Scott Wade, the head of operations at Exponential Digital, the company that operates the mine and was acquired by PrimeBlock last January, uses anywhere from 5 to 15 megawatts annually, enough to power up to 13,500 homes. (A gaming laptop, by comparison, would use 0.02 megawatts running year-round.)

Up until 2021, most of the world's crypto mines

The PrimeBlock cryptocurrency mine on October 14, 2022. A section of the partial enclosure can be seen in the background.





"For me, it's more than just my hearing. It affects my whole body," says Patricia Callahan.



THIS PAGE: Murphy resident Gene Johnson says he can still hear the mine with his hearing aids out. **OPPOSITE:** Downtown Murphy, North Carolina.

were housed in China. But when the country banned the use and mining of cryptocurrency that fall—largely because of the Chinese government’s fear that cryptocurrencies are a gateway to financial crime and have a negative impact on the environment—miners flocked to the U.S. According to the Bitcoin Mining Map developed by the University of Cambridge in the U.K., the U.S. now makes up the majority of the total global hashrate, or the computational power processing cryptocurrency transactions.

In the U.S., crypto companies generally set up shop in places like the Finger Lakes region in upstate New York, eastern Washington, South Dakota, and towns like Murphy along the Tennessee Valley. They all offer cheap electricity, and often, mines can be built in repurposed factories.

Not only is noise pollution an issue, but the annual electricity use worldwide from exclusively mining Bitcoin—just one type of cryptocurrency—is extensive. Some studies estimate it can even exceed that of entire countries. This overall higher community electricity use raises the cost for residents.

▶ THE PAIN OF NOISE POLLUTION

Because cryptocurrency is relatively new, there are few peer-re-

viewed studies that specifically link it to how its mines affect human health and the environment. Twenty-two state legislators have written to the EPA to monitor the environmental impact of mining cryptocurrency. But noise is the primary complaint in Murphy, and plenty is known about how loud, persistent, low-frequency sounds can lead to a host of problems.

In the 1970s, the U.S. Environmental Protection Agency’s Office of Noise Abatement and Control recognized noise as a pollutant and began taking steps to limit community exposure. Through the now-defunct office, researchers determined that, to ensure their health and welfare, residents shouldn’t be exposed to more than an average of 55 decibels over the course of a day. Anything higher, in terms of sound level or length of exposure, could increase an individual’s chances of hearing loss.

Even though the world around us has gotten noisier since then—particularly in cities and largely due to industrial noise—our ears can’t adapt accordingly, says Deanna Meinke, PhD, an audiologist who studies dangerous decibels at the University of Northern Colorado in Greeley.

Over the last few decades, researchers have seen that prolonged exposure to noise can lead to high blood pressure and other cardiovascular issues, and even exacerbate mental health disorders. What’s more, noise pollution can be more detrimental at night, when our bodies are much more vulnerable to sounds during sleep.

And sound-level guidelines for health impacts beyond hearing loss don’t yet exist. “We don’t have limits for a noise level that would prevent heart attacks, or prevent high blood pressure, or prevent depression,” says Rick Neitzel, PhD, a noise pollution expert at the University of Michigan.

In 2020, an international team of researchers published a study in *European Heart Journal* where they followed about 500 healthy adults for five years. They found that every five-decibel increase over a baseline 45 decibels for a 24-hour span was associated with a 34 percent jump in heart attacks, strokes, and other cardiovascular issues.

And in the early 1990s, the Federal Aviation Administration (FAA) sponsored several studies to determine how loud an airport could be without making residents seriously annoyed. They found that about half of the residents reached that threshold of annoyance when exposed to an average of 75 decibels over a 24-hour period, although they didn’t characterize how that manifested in health impacts. But about 20 years later, a group of German researchers tracked over 2,300 residents who lived in the flight path of Frankfurt Airport, and found that the individuals who reported to be “strongly annoyed” by the noise were twice as likely as others to feel depressed or anxious.

The annoyance and resulting stress that Callahan and her neighbors face shouldn't be discounted, says Neitzel. "Annoyance is a huge byproduct of noise exposure, and we don't really understand how important that is in terms of putting someone at risk."

When noise becomes a stressor—as it has been in Murphy—it activates the adrenal system, which not only responds to stress but also regulates an individual's immune and cardiovascular system. "It's not good to spend 8, 10, or 12 hours a day in that condition," Neitzel says. It can drive up heart rate and blood pressure, and cause problems down the line.

► ENVIRONMENTAL EXODUS

As soon as the mine came online, residents in the surrounding neighborhood began noticing changes in animal behavior. Ronny and Kathy Williams, who live atop Poor House Mountain Trail, lament the decline of birds in their backyard, where they keep multiple feeders. "We've seen very few goldfinches this year. The house finches came and went. And I've only seen one Carolina wren this year," Ronny says.

Meanwhile, Phyllis Cantrell, who lives about as far from the mine as the Williamses, has noted that hawks and eagles no longer nest nearby. The hummingbird feeders on her deck she used to refill four times a day are now going three days before she replenishes them.

The area near the mine used to be prime habitat for wild turkey and deer. Now, they're moving farther up the mountains. Morris, for instance, has recently found deer in her backyard for the first time.

A herd of horses that live on a patch of land across from the mine on Harshaw have been trying to flee more frequently, too, according to the Lugiewiczzes, who live across from where they're kept. On a warm weekend last December, on a day when the fans from the mine were especially loud, Jennifer and Shannon Coleman spent an hour trying to wrangle the horses—who seemed spooked by

the noise—all the while shouting over the din, standing just five feet away from each other. And dogs begin howling, says Cantrell, when the mine is especially loud at night.

Research shows that

Researchers have seen that prolonged exposure to noise can lead to high blood pressure and other cardiovascular issues, and exacerbate mental health disorders.



LEFT: Patricia Callahan lives about a quarter mile from the cryptocurrency mine. She says its noise triggers her PTSD symptoms. **RIGHT:** Beaver Ridge Trail loops around the neighborhood next to the mine.

hundreds of animal species are affected by noise, says Clinton D. Francis, PhD, an evolutionary ecologist who studies noise pollution at California Polytechnic State University, San Luis Obispo.

The ability to perceive sounds and respond is a part of a “universal threat detection system” across vertebrates, he says. “Hearing is used to passively listen for threats while we’re doing other things.”

The impact of noise pollution is perhaps best characterized for birds. They may modify their songs to be at a higher pitch or sing more frequently to stand out amid the noise. Some field research shows that about a third of birds may completely leave an area because of noise pollution, with major ecological consequences. In 2012, Francis and his colleagues published a study that showed low-frequency industrial noise from gas wells and compressors (clocking in at around 95 decibels) reshaped areas of the Rattlesnake Canyon Habitat Management Area in northwestern New Mexico. Birds there are critical in dispersing seeds of the Colorado pinyon pine. And now, some preliminary research from Francis’s group suggests that noise pollution may lead to inheritable changes in specific species and populations. In other words: Noisy enterprises like crypto mines can alter the wildlife near it for generations to come.

But Francis is heartened by the fact that when the source of noise is removed, animals reclaim where they once lived. Think back to the early days of the COVID-19 pandemic, for instance, when the songs of the white-crowned sparrows in San Francisco grew more frequent when the din of the city subsided, or lions napped along traffic-free roads in South Africa.


▶ LAX ZONING LAWS AND FEW ANSWERS

Despite the annoyance, the deleterious health effects, and the damage to the ecosystem, there’s no legal protection for the residents

of Murphy due to scant zoning laws in Cherokee County, which would otherwise protect residential areas from industrial development. Already, there are three mines in the county, and citizens fear more may be coming.

Some Murphy residents have left because of the noise from the mine. Others who have put their life savings into their idyllic mountain home have no choice but to fight for change and show up to the commissioners meetings in droves. So far, the residents’ concerns about noise mostly have fallen on deaf ears. They’re also frustrated by the lack of answers from their five commissioners as to how the mine ended up there in the first place.

They’re trying to get their elected officials to enforce a 1999 county ordinance under which perpetrators are fined \$50 a day for sustained noise above 50 decibels. But the commissioners say that the ordinance is unenforceable without the zoning



laws that Cherokee County lacks.

And without zoning laws, it's impossible for anyone to find a legal standing to hold anyone accountable. In Limestone, Tennessee, where the cryptocurrency company Red Dog set up shop, residents had recourse because Red Dog violated an existing zoning ordinance. That county sued and won. The mine is set to shut down by the end of 2024, pay associated penalties, and relocate away from a residential area.

The Cherokee County board of commissioners—particularly Dan Eichenbaum, Gary Westmoreland, and Randy Phillips, who locals refer to as “the triad” for their similar voting patterns on controversial issues—are not keen on changing the status quo. None responded to comment on this story. And amid the calls for zoning reform, a quieter contingent of Murphy residents don't want any government interference in land use or rights.

Since the Murphy mine was set up last fall, it was partially enclosed by wall sections in February, but locals say that only made the sound worse, as the openings between the walls funnel sound in very specific directions. Wade, of Exponential Digital, said that this partial enclo-

sure helps them “maintain and preserve natural cooling and airflow, resulting in a more energy-efficient operation while further mitigating sound.” Moving forward, Wade says, the company will work closely with the commissioners to ensure the facility doesn't generate more noise.

For now, Morris hopes that this year's election will help, as the residents can vote for someone who will make decisions in their interests. “Until you get the commissioners behind this and really start pushing for it, change isn't going to happen,” she says. “It starts with them.”

Since the bullet on her doorstep, Morris has taken a backseat at the meetings, but she's still attending and staying engaged. Already, not even a year out, she's tired, and looking forward to what eventually—could come after the mine. For her, it means peace and quiet, and the paradise that Murphy promised. ■