A Qualitative Exploration of the Effects of Mountaintop Removal

on the Wellness of Central Appalachians Living Near Surface Mines

by

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ABSTRACT

Mountaintop Removal coal mining (MTR) and other forms of large scale surface mining have been linked with a number of deleterious environmental, economic, community, and physical health effects in Central Appalachia. However, researchers have yet to give much attention to the possible mental health effects of MTR on those directly affected by it and a comprehensive picture of the effects of surface mining on the overall wellness of residents has not been developed. In Central Appalachia, effects of environmental problems are compounded by pre-existing social and economic inequalities. Past research and anecdotal reports suggest that MTR may negatively affect the overall wellness of those who live close to surface mines. I used grounded theory methods of data collection and analysis to explore the overall effects of MTR on wellness in Central Appalachia. Focus group interviews were conducted in six different communities across the region: two in Southern West Virginia, two in Eastern Kentucky, and two in Southwestern Virginia. Separate focus groups were conducted with people for and people against MTR so that my research would not result in further community divisions surrounding the issue. Results indicated pervasive negative effects on wellness that align with and extend previous research and anecdotal reports. Problems with emotional wellness in relationship to surface mining were reported by many participants and were, in some cases, severe. There were few significant differences between the opinions of those for and those against surface mining about its effect on wellness.

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CHAPTER 1

SUMMARY OF THE ISSUES

Central Appalachia has relied on natural resource development for economic survival for many decades, and the coal industry has long been primary among extractive industries in the region (Eller, 2008). Over time, technological advancement has led to increasingly economically efficient methods of coal mining. Mining was once done primarily through underground methods, but much coal mining is now done though surface mining processes. In Central Appalachia, 40-45% of coal is now surface mined (Perks, 2009; West Virginia Coal Association, 2013).

In one large scale form of surface mining known as mountaintop removal coal mining (MTR), explosives are used to remove mountaintops (termed "overburden" by the coal industry) and expose the coal seams underneath them (Palmer et al., 2010; Reece, 2006). In the process, the forests that cover these mountaintops are destroyed and the "spoil" (the rock and rubble once created in the explosions) is often pushed over into the valleys burying streams (Burns, 2007; Epstein, 2011). A growing body of research has correlated this process with a wide range of environmental problems including stream loss, water pollution, forest loss, and flooding (Negley & Eshleman, 2005; Palmer et al., 2010; Perks, 2009; Shnayerson, 2008; U.S. Environmental Protection Agency, 2005). These problems also negatively affect the region's diverse animal and plant populations (Wickham et al., 2007; U.S. Environmental Protection Agency, 2011).

A large number of recent studies have linked MTR with human health problems in Central Appalachia (Hendryx, 2013; Hendryx & Ahern, 2008; Hendryx, Fedorko, & Anesetti-Rothermel, 2010). In addition, anecdotal reports, interviews, and a few research studies have

linked MTR to a wider range of problems related to human wellness (Bonds, 2009; Burns, 2007; Hufford, 2002; Stockman, 2004). These difficulties range from mental health concerns to community disintegration to cultural disruption.

Although research has begun to uncover various aspects of wellness that are impacted by MTR, most notably physical and environmental wellness, a comprehensive picture of the effects of MTR on the human community in Central Appalachia has not been developed. The aim of the current exploratory qualitative study is to begin to develop a more holistic picture of the effects of surface mining on the overall wellness of those who live near it.

Methods

Participants

Thirty-two participants took part in six focus groups conducted in three states: Kentucky, West Virginia, and Virginia. These states were selected because they are the most heavily surface mined states in Central Appalachia. In each state, one focus group was composed of community members who identified as pro-surface mining and the other of those who identified as anti-surface mining. I took this approach to capture the opinions of those on both "sides" of the issue while avoiding the creation of further conflict surrounding this hotly debated topic. There were almost equal numbers of male and female participants. The majority of participants identified as White (91%). One participant identified as White/Native American, one as White/Hispanic, and one as Hispanic. All "non-White" or multiracial participants were members of anti-surface mining focus groups. Participant characteristics are described further in Table 1.

Participants were recruited through snowball sampling in which a key informant, identified for each group, helped recruit other participants who also lived near surface mines. I identified key informants through colleges and university contacts who knew residents of surface

mining communities. Each focus group consisted of four to eight participants. All participants self-identified either as pro- or anti-surface mining when agreeing to participate. On the day of each focus group, participants were also asked to rate their opinion of surface mining on a five point scale with 1 indicating "I strongly support surface mining," 5 indicating "I strongly oppose surface mining," and "3" indicating "I am neutral about surface mining." Fourteen of the 15 participants in the anti-MTR groups circled the 5 indicating that they "strongly oppose surface mining," and one participant circled the 4. Responses to this question in the pro-surface mining groups were much more varied, suggesting a greater amount of ambivalence in these groups than in the anti-surface mining groups.

Focus Group Rationale and Process

I chose focus groups for this project because of the particular advantages they afforded. The groups helped to shift the balance of power away from the researcher and onto the participants; although the interviewer selected the questions for the focus groups, the group members exercised control over their interactions with each other and over the direction in which they took the questions (Wilkenson, 1999). In addition, focus groups helped the researcher to avoid de-contextualizing participants; data were gathered with groups of culturally similar participants in a setting familiar to them (Suzuki, Ahluwalia, Arora, & Mattis, 2007). Participants were largely free to relate to one another as they typically would; thus, cultural norms and values were highlighted in participants' responses (Kitzenger, 1995). Another advantage of focus groups was that they allowed for information to be gathered from several participants at once, making sampling across states more practical (Suzuki et al., 2007). Sampling from several areas of Central Appalachia affected by MTR gave a more representative picture of the issues.

The groups were held in community centers, private homes, and, in one case, in the back room of a small convenience store. Each group lasted about two hours. Participants filled out a demographic form and gave oral consent to participate. In order to protect participant anonymity, I did not collect signed consent documents. The interview guide was simple: participants were given a sheet of paper with an image of a multi-colored wellness wheel printed on the front (University of Miami, 2009). The wheel contained eight sections with the following aspects of wellness listed in the segments: environmental, physical, occupational, emotional, spiritual, cultural, social, and intellecutal (See Figure 1). Participants were asked to talk about how living near surface mining affected them in each aspect of wellness. Because of the political connotations associated with different terms for MTR (it is called mountaintop mining by the coal industry), the term "surface mining" a more general term for coal mining done above ground was used. In each group, I mirrored the language of the participants. Most commonly, participants referred to the mining processes near them as "strip mining."

Focus group interviews were audio recorded. Audio recordings were deleted after transcriptions were completed. Each participant was thanked for sharing his or her time and knowledge with a $20 gift card to Wal-Mart.

Data Analysis

The research questions that guided this study were as follows: What effect does living in communities directly impacted by surface mining have on the overall wellness of residents? Do those for and those against MTR perceive the mental health effects of MTR differently? Because little research has been done on the topic to date, I employed grounded theory methodology (Fassinger, 2005). The aim of this approach is to use data to develop theory to explain a process

or phenomenon and to help supply a framework for future research (Patton, 2002). Coding is the data analysis process used in grounded theory. Coding is typically completed in three stages: open coding, axial coding, and selective coding (Fassinger, 2005; Strauss & Corbin, 1998).

In open coding, the data were coded line by line for major concepts and these concepts were labeled (Creswell, 2007). In axial coding, the relationships between categories began to be uncovered and subcategories were created and placed under the umbrella of key categories (Strauss & Corbin, 1998). Typically, in selective coding, hypotheses that connect the categories in the model are developed (Creswell, 2007). In this case, the data collected was not comprehensive enough to allow completion of this step. While a beginning framework for further research was developed, it would be pre-mature to outline a theory with data from only six focus groups. At several points in the data analysis process, the coding scheme was audited to help verify accuracy. Two Radford University professors with qualitative research experience examined the emerging themes and subthemes and gave feedback as to the accuracy and fit of the categories derived from the data.

Trustworthiness

In qualitative research, the interaction between the researcher and the participants is an important part of the process (Yeh & Inman, 2007). Interactions between the researcher and the participants influence both the research process and the data that are obtained (Patton, 2002); it also is important for the researcher to make her social position in relationship to the subjects of research explicit, exposing implicit assumptions and biases, so that others can determine how her worldview may have affected research results or interpretation (Morrow, 2007; Ponterotto & Grieger, 2007). Thus, I now describe aspects of my personal background that are relevant to the

proposed research. I am a White female in my early 30's. I grew up in rural West Virginia. Underground mining was practiced in the area where I grew up, and I knew miners from my church and school communities, but I was not aware of the practice of surface mining until I left the area to attend college.

I attended Berea College in Kentucky. Berea College is an institution well-known for its social justice commitments in the Appalachian region, and it was at Berea that I learned about mountaintop removal coal mining and its effects on the land and people. I am currently a student in Radford University's counseling psychology doctoral program, which has emphases in social justice, diversity, rural practice, and evidence-based practice. I participate in anti-mountaintop removal activism and believe that coal mining and the monoeconomic system surrounding it has had many negative effects on the region. I have never lived in a community directly impacted by surface mining. Although I do believe that MTR is harmful both for the environment and for the people of Central Appalachia, I also believe that the people directly impacted by the process are in the best position to understand how it affects them. I also know that it was essential for me to monitor and compartmentalize my own opinions about the issue in order for me to accurately understand the perspectives of my research participants. As a therapist-in-training, I have learned how to listen to others well, express the empathy that I feel for them, and help others feel safe and comfortable in sharing their thoughts and feelings. These skills aided me in this research as well, especially because we were talking about sensitive and controversial issues.

Results

Data analysis produced seven themes and 29 sub-themes. The themes that emerged generally followed the sections of the wellness wheel used in the interview guide (University of

Miami, 2009). It can therefore be said that the themes arose as a result of the questions asked and were not general ideas that emerged across the course of each focus group. The wellness wheel visual prompt was beneficial as it helped to organize or focus the groups. However, if participants had simply been asked to talk about the impact of surface mining on wellness and had not seen the wheel, they may have talked about other aspects of wellness. The seven themes are: Environmental Wellness, Economic/Occupational Wellness, Emotional Wellness, Cultural Wellness, Social Wellness, Physical Wellness, and Intellectual Wellness. Although participants also talked about aspects of Spiritual Wellness, the eighth section of the wellness wheel on the interview guide, their comments about this topic were not consistent enough to form any subthemes. Each of these overarching themes is broken down into its subthemes and described in the sections below. Sub-themes were included if they were mentioned by at least five different participants and across at least three groups (15.6%).

Some themes were given greater attention than others by the focus group members. Themes are organized hierarchically so that the themes that were given the most attention by participants are described first and the themes that were given the least attention are described last. Specifically, themes are organized by the number of quotes in each theme. Sub-themes are also organized in a hierarchical fashion by number of quotes, number of groups that mentioned the sub-theme, and number of participants that mentioned the sub-theme. These numbers are noted next to the heading of each sub-theme. Sub-themes that were mentioned by only pro-surface mining participants or only anti-surface mining participants are included at the end of each themed section. Differences and similarities between pro-surface mining and anti-surface mining groups are highlighted. Illustrative quotes are provided under each sub-theme to highlight

the voices of the participants and clarify the concepts. See Table 2 for a complete list of themes and related subthemes.

Environmental Wellness

Environmental issues were mentioned frequently across the groups. Anti-surface mining groups talked about these issues most frequently, but both types of groups spent a good deal of time discussing environmental issues. Those in the pro-surface mining Virginia group had very few complaints about environmental problems associated with surface mining and generally argued that surface mining has led to some environmental improvements in their region.

Water Pollution/Water Loss (73 quotes, 6 groups, 20 participants)

Problems with water were the most heavily focused upon aspect of environmental wellness. Those in the pro-surface mining groups expressed mixed opinions on the issue. Some reported that the water in the area is cleaner than ever. This positive view was mostly held by pro-surface mining participants in Virginia. “Water now is probably cleaner than it was 20 year ago. I guarantee it.” Typically, this group credited the coal industry with improving water quality by providing revenue to build infrastructure. Participants in this group cited some problems with water because of coal mining activities, however. For or example, one participant talked about the leakage of coal waste water. Coal waste water, often called slurry or sludge, is the liquid or semi-liquid product left over after the coal is cleaned (Sludge Safety Project, 2011). “Oh, no. It ain't treated, it's not treated at all. See the mining companies are out of there now, so that’s just the natural order of things. It's running down over into the [creek].

Those in the pro-surface mining groups in Kentucky and West Virginia were less positive about water quality. As one pro-surface mining participant stated: “If you live in a close

environment with the stripping, your water that you drink is probably about the first thing that they mess up" (KY-Pro). A participant from the West Virginia group talked about the effects of the mining on the water near his home:

> They pump [the waste water] out of the plant, pump it through a pipe, and they've drilled wells all over these mountains. They dump it down those wells in the old coal mines… Now, behind my house they've done that. And if it rains and the mud holes sit for a day or two, you can see the oil sheen on top of the water.

Those in the anti-surface mining groups spoke about water pollution through surface mining as well. One participant from Virginia described the effects on the water this way:

> Whatever's on that highway and whatever's coming off those trucks…all those harmful chemicals and other stuff that's mixed up in that blasted up area, once it's tracked onto the highway and once it's deposited there as mud and once it's washed off…it all goes into our streams…Our stream below my house…it's filled up with silt and dead. A few years back, I had the EPA come down and check it and they said there was no life in it.

The blasting that is used to remove the "overburden" in surface mining has been known to destroy wells. Underground aquifers are sometimes cracked in the blasting process, allowing oil, gas, and sediment to leak into the aquifers and permanently contaminate the wells that they support (Blakeney & Marshall, 2009). Alternately, water can run out of cracked aquifers, causing wells to go dry. A participant from Kentucky talked about the effects of blasting on the family's wells: "We had well water, drilled wells, and we lost a well from the blasting, it broke up the casing." This participant had the family's water tested and reports that it had: "130 times the recommended levels of arsenic in it. That's what [my daughter] bathed in for the first 3 years

of her life. Water pollution and well loss was a major concern for many participants, especially those in the anti-surface mining groups.

Surface Mining Regulations are Followed/Not Followed (66 quotes, 6 groups, 21 participants)

One topic that was given a good deal of attention in both pro and anti-surface mining groups was that of surface mining laws. There was a great deal of divergence in opinions about the extent to which mining regulations are followed, both between group type and within group type. Some were very confident that surface mining is done according to legal standards. For example, pro-surface mining Virginia participants stated the following: "When they blast, they always sound off." "They got a regular street sweeper, it goes from the strip job over above me to the [next] strip job. It goes over and back 3 or 4 times a day just cleaning." "[The coal company] is very, very focused on running right." Those in the pro-surface mining Kentucky group expressed some similar view points: "One thing they do when they haul coal out of there, they definitely start watering that road." But this group along with the pro-surface West Virginia group seemed less confident that the coal companies follow regulations than the Virginia group seemed. "They do some things by the book like they're supposed to and then some things they don't" (Pro-KY).

One Kentucky pro-surface group member who lives just below a surface mine stated: "They're only supposed to let off one [blast]…yes, one a day about 3 or 3:30. They totally lie is all I can say….They do it about two or three times a day. I'm there. I know."

In the anti-surface mining groups, there were many complaints of regulations being broken by the mining companies. Anti-surface mining group members from Virginia and

Kentucky talked about surface mining operations or practices that were not permitted happening near their homes. “They sneaked in there…They stripped for over a year up back in there and didn’t even have a permit to do it.” (VA) “They do illegal stuff. They did 2 illegal valley fills” (KY). Others in the anti-surface mining groups describe specific regulations violated on the mines near their homes. This participant talked about regulations involving coal trucks:

> They wouldn’t even cover them trucks. They was supposed to have a…curtain, this thing that goes down over it. And they would have it way up past that, and it falling all over the road in front of the house (VA).

Another discussed blasting rules: “If they wanted to put a shot off at 11:00 at night or whenever they wanted, they would do it. That’s illegal as it could be. It’s supposed to be from sunrise to sunset” (KY). Some participants talked about coal companies committing many violations near their homes: “Anyway, with her health, we started a little project to see how many violations this one coal company has committed. There’s over a hundred violations” (VA). The pro and anti-surface mining groups differed to some degree on the extent to which they believed that the coal companies were following mining regulations. However, all groups except the pro-surface mining Virginia group voiced concerns over illegal behaviors of surface mining companies that they believe put local residents in danger.

Environmental Devastation and Loss of Beauty (39 quotes, 5 groups, 16 participants)

Some group members from both sides of the issue talked about devastating effects of surface mining on the overall environment. Those in the pro-surface mining Virginia group saw the environmentally damaging effects of surface mining as a thing of the past. “But the thing that we did when we were pushing it over the hill, now that was a scourge. We did well to quit that,

because that just made a wreck of things." They also asserted that environmentally negative effects of surface mining are more of a problem in other states.

But members of this and other pro-surface mining groups did talk about some environmental problems with surface mining. As one Kentucky pro-surface mining participant stated to another: "Well, that's your holler. They're going to tear it all to pieces before they get through with it." A pro-surface mining participant in West Virginia expressed very similar concerns: "That's the only thing that I think is wrong with strip mining is they tear mountains to hell." Pro-surface mining West Virginia participants described the environmental devastation they perceived in the following ways: "You almost feel like you've landed on the moon." "It looks like a cancer." "It's just a big, festering wound."

Anti-surface mining participants described similar environmental destruction. "Every ounce of everything down through there, they destroyed it all" (VA). An anti-surface mining participant from Virginia said it this way:

> It's destroying this area, and it's almost the oldest mountain range in the whole world and the most diverse mountain range in this world...How can they justify destroying that? All the organisms. All the life. All the vegetation and the trees…Blasting it.

One specific element of environmental destruction that participants addressed was the loss of natural beauty. Participants from both "sides" mentioned the aesthetic changes associated with surface mining. Virginia pro-surface mining participants mentioned these changes as being one of the main reasons that some people oppose the practice. "One of the biggest problems with stripping is it's visual. You can see it. And if you can see it, people can fuss about it." Some

participants in this group argued that aesthetic changes resulting from surface mining could be beautiful and that former surface mines might even be good tourist attractions:

> People spend a fortune going to the Grand Canyon. There's not a whole lot of difference if you start going out west and look at the way the rock formations are and then start looking at all these strips around here that's not been reclaimed.

In contrast, those in the anti-surface mining groups lamented the loss of beauty near their homes as a result of surface mining:

> They…tore up that big mountain. It was a beautiful mountain there. You can look up there and? see how horrible it is. It's a big slurry pond there now" (VA).

Participants talked about the contrast between the areas that are untouched and the areas that have been surface mined: "When I go hiking up in the hills, I can look one direction and see just a total chopped off mountain, and I can look the other way and see beautiful hills" (KY).

Reclamation Successful/Not Successful (37 quotes, 5 groups, 15 participants)

Those in the pro-surface mining Virginia group argued that reclamation is done and is done well in their area, although they did express a few concerns. Some from this group talked about successful reclamation projects:

> There are poplar trees out there that are that big around. And there are pine trees. We planted those in the 70's, I guess, when we stripped that one section. I've got pine trees that big out there.

Others expressed similar opinions:

> [They] had some land stripped over there, and they started an orchard on it…Three years later [my neighbor] was at a symposium at [a university], and he had a couple of bushels

> of really beautiful red and golden apples, and he was passing them out up there…and he was grown on a strip job.

Participants in the Kentucky pro-surface mining group also expressed positive sentiments about the reclamation efforts that occur. "They do reclaim it." "That there's a whole lot. They'll plant trees and clean your streams." However, these participants, along with the pro-surface mining West Virginia participants, also expressed concerns about reclamation:

> When they get done, if they'll reclaim it all, and like you said, plant trees and do all that stuff, it's fine. But you get some of these places they…go in there and think they can reclaim it in two or three days and make it worse than what it was before they started (KY).

A West Virginia pro-surface mining participant stated: "But they don't put trees back on it. They just cover it up with dirt and rock, you never see the trees come back on it." Another described his opinion about how the companies approach reclamation: "Cheap as they can" (WV).

Those in the anti-surface mining groups did not share any of the positive opinions about reclamation efforts that were mentioned in the pro-surface mining groups:

> …When we blow [the mountains] up and push all that debris down slope and into the stream beds, then we go back and do what we declare is reclamation…But it was not the approximate of what was there to begin with. Nowhere close (VA).

There are those who see reclamation efforts as successful, and those who express concerns about how reclamation is done.

Dust/Air Pollution (28 Quotes, 5 Groups, 12 Participants)

Participants in both group types agreed that dust is a problem with surface mining. However, there were differences of opinion within and between group types about how well dust is controlled. Specifically, pro-surface mining participants from Virginia maintained that the coal industry does a good job of following regulations to keep airborne dust to a minimum.

> The dust used to, if you were on a strip job, there was float dust, which is about the consistency of baking flour, six or eight inches deep on the road, any vehicle that went through it, it would clog up your filters, it would just ruin the equipment. Now, there's water trucks that have four or 5,000 gallon tanks on them and they go back and forth and they wet those roads all the time.

Other pro-surface mining participants were more concerned about the dust. Some agreed that the coal industry does attempt to minimize dust.

> But as far as the working right there on the mountain…even the kudzu gets dirty, around his place it's all kudzu because it's [near] an old mine. An old deep mine. But, yeah, the dust is real bad. But they do keep the roads watered when they're hauling coal out of there.

As one pro-surface Kentucky participant stated: "Where I live at, the blacktop ends. So, when a coal truck comes, the dust starts stirring right there at my house."

Those in the anti-surface mining groups had many complaints about dust. "Everybody who comes from out of this area and comes here and looks at this place and wonders how in the world people can live in a community where it's so dusty you can't breathe" (VA).

Those in Kentucky and West Virginia also mentioned problems with dust. One participant reported that her daughter could not even go out to play in the yard without covering

her face because the dust was so bad near their home. “And not only that, when she got big enough to go outside and play, like on her swing or anything, it was so dusty over there that we had to put a handkerchief across her mouth and nose so that she wouldn't breathe that stuff in.”

Damage to Homes (25 Quotes, 5 Groups, 10 Participants)

Participants from both group types mentioned home damage as a consequence of surface mining. This sub-theme is included here although home damage is related to the built environment and not the natural environment. Those in the pro-surface mining groups discussed ways that surface mining affects homes near mining operations.

> Strip mining, when you have it near your home, there's no question about it. It's a scourge. I don't care how good you blast or anything. You mess up the foundation of people's homes. You do. It's just fact (VA).

According to these participants, one’s home can be damaged by blasting, by rock slides, and by dust. Another pro-surface mining Kentucky participant describes how blasting and rock slides can totally destroy a home.

> Well, you see at least once or twice a year somebody's home is destroyed by blasting. A rock coming off on their house or like you was talking about the ponds, they don't fix them right, and then you've got a big slide comes off that destroys your home (KY).

Some of these participants have faith that the coal companies will help with such home damage. “They pay for your foundation if there’s an issue” (VA). Others are not as confident in the coal industry’s willingness to fix damage to homes. “They've been there about five years and all the hard blasting, it pops the tin on my home and everything. But they try to hide all that” (KY).

Those in the anti-surface mining groups also talked about home damage because of surface mining. In fact, some in these groups reported losing their homes altogether to surface mining operations.

> I used to live not too many miles right up here and had three strip jobs blasting and they literally blasted my house apart…I had a nice home and me and my son had re-done it. And my house, what's left of it, is buried up there in a slurry pond. My beautiful home. They blasted it apart in '04 (VA).

Others talked about how they have struggled to maintain their homes even as they continue to experience the negative effects of surface mining. "Well, right now we need to put support under ours. It shakes." (KY). "Our whole house is falling apart now" (WV). "You can see cracks in the walls" (WV). "Yeah, they didn't fix it back right. The trailer just ain't the same…It seems like the ground is sinking" (WV). "I just spent $8000 dollars on mine to get it braced back up" (KY).

Flooding (14 Quotes, 5 Groups, 10 Participants)

Flooding was also discussed as a consequence of surface mining. Flooding was not reported as a major problem by most in the pro-surface mining groups, although one participant in the pro-surface mining Kentucky group stated that frequent flooding was a problem for his family. Two group members in the pro-surface mining Virginia group had this exchange: "I think there's no more [flooding] now than it was then." "Probably less. There's less flooding now." A pro-surface mining participant from West Virginia reported family members who live in other areas of the state being affected by flooding that he believed was related to surface mining.

Participants in the anti-surface mining groups saw flooding resulting from surface mining activities as more of a problem. “Well, it's like Logan there last week, and a bunch of other places…I mean there ain't nothing there to hold that water back” (KY). Another Kentucky participant reported increased flooding near her home after surface mining began:

> After they started stripping…we've had I don't know how many floods come.
>
> I mean it washed the drain tiles and everything out. And it even got in our basement…. It was what about four feet deep.

Participants in the anti-surface West Virginia group also reported increased flooding:

> This was right after a flood is why [several state politicians] came here. This creek was wiped out, and they was looking at all this damage. Sewer systems tore out. Water systems tore out that had just been installed back through the Abandoned Mines Funds project. Bridges washed out. FEMA had to come in here. The federal government had to come in here…

Another West Virginia participant talked about her experience with flooding after surface mining began near her:

> We got flooded [in ‘09]…Because of the mines behind us, out of all the hollers, every one of them…our house was the worst one when it got flooded. But [my daughter’s] room, and her brother's room... they had to take the window out and re-do that whole thing.

Participants in Kentucky and West Virginia reported directly experiencing significant flooding.

Loss of Animal and Plant Species (14 Quotes, 7 Groups, 4 Participants)

Many participants expressed concern over the loss of animal and plant species. A participant in the pro-surface mining group from Virginia talked about the need to conserve even though he denied being concerned about protecting every species. "Now we might kill a snail darter or something like that, but…you may move those things." One pro-surface mining participant from West Virginia expressed worry over the potential loss of fish but couched his concern in the fact that species loss has long been a problem in his area so that further species loss because of surface mining may not have that big of an impact.

> I figure it won't be much longer and all the fish will be gone, and everything else unless they do something about it. But at the same time…there haven't been any fish on [this creek] for years, and they've got a few fish up there now. Won't be much change up there because if they haven't been for years, nobody will notice much difference if they all disappear again.

Those in the anti-surface mining groups also expressed concerns in this area. A participant from Virginia said it this way:

> You could go to any of these creeks and catch you a mess of fish. You could go and catch you some animals to eat. And people did that. And you can't now that the creeks are dead with toxic waste and stuff that comes of the strip jobs...The wildlife and the animals and everything, they're dead (VA).

A participant from Kentucky mentioned the loss of crayfish in the creek near his home: "Crawdads? What are those? They're not even in there anymore." Participants in the West Virginia group lamented the loss of crayfish as well, along with the loss of ginseng. These losses are further explored in the Cultural Wellness section.

Forest Loss/Logging (11 Quotes, 4 Groups, 8 Participants)

Another environmental consequence of surface mining that participants brought up was forest loss. Pro-surface mining participants talked about this forest loss: "There can't be not one tree on the mountain when they mountaintop remove it. They devastate the mountain" (WV). These participants also talked about changes in the forest through and the reclamation of former surface mine sites: "The reclamation people have brought in invasive species of trees that we are now fighting tooth and nail...and they're worthless…" (VA).

Those in anti-surface mining groups discussed the problem of forest loss as well. Two anti-surface mining participants from Virginia put it this way: "They went around up here and got them logs, you know before they stripped…They just pushed them up in a pile there and burned all these huge trees." "At one time, it's not been a couple of years ago, [one coal company] alone was cited for destroying over a million trees behind one of their plants. There used to be 600 trees an acre back there."

EPA/Politicians/Laws for or against Coal Industry (14 Quotes, 4 Groups, 7 Participants)

Pro-surface mining participants mentioned this sub-theme much more frequently than did anti-surface mining participants, but they see the issue fundamentally differently. Most pro-surface mining participants who mentioned political influence on the coal industry believed that government forces oppose and strictly limit it. As one Kentucky participant stated:

> But even the EPA now they're trying to make it to where you can go into a holler and take a water sample, and then mine, but they want you to put the water back better than it was before they started mining…The EPA is trying to make it so strict that they are eliminating mining.

Those in other groups expressed similar opinions:

> You can't prove it by these politicians now because really they're cutting our throat in a lot of different ways. They're dead against mountaintop removal. They're really killing this state. That's all this state is: coal. They're wanting to do away with it (Pro-WV).

Comments about this issue in the anti-surface mining groups were almost directly opposite of those made in the pro-surface mining groups:

> The [Department of Environmental Protection] was formed for two reasons. One is to protect the industry and to make sure they operate and don't get false lawsuits. And the other part is to make sure they don't make violations to cause a lawsuit. But when they testify with lies against average citizens, they have become a force of evil. And that's what the majority of them are (Anti-WV).

One participant in the anti-surface mining Virginia group expressed the belief that the enforcement of the laws does create hardships for the coal companies:

> Of course the EPA, now, you have to give them credit. They have tried and they are trying and they're catching it from everywhere, except the President…They're catching it from all sides. Every ore producing industry in this country is after the EPA…because what they're doing in enforcing these laws is creating hardships.

In general, beliefs about the extent to which government agencies enforce surface mining laws and about the attitude of the government towards coal vary between group types.

Landslides (10 Quotes, 4 Groups, 6 Participants)

Landslides were a problem mentioned by some participants in both group types. Some group members complained about landslides as a problem brought about by reclamation practices. A pro-surface mining participant from Virginia stated:

> And the way they're getting the water to go into [the ground] when they're leaving [the spoil] loose. That's good. It's better than letting it run off, but when water gets in underground and so forth, it's a lubricant. It's going to slide. It's going to move (VA).

A Kentucky pro-surface mining group member compared surface mining to deep mining in terms of negative effects: "Surface mining [is worse] because you know you have more problems with the slides and rocks." Participants from the pro-surface mining West Virginia group concurred with participants in the other two groups:

> Now, behind my house they've done that. The slurry will run out the coal seams and will slide down the side of the rock. It will cause landslides. There has been a landslide up behind my house, a landslide up the road from me...

Those in the Kentucky anti-surface mining group shared concerns similar to those in the pro-surface mining groups: "Every time it comes a big, hard, heavy rain, here comes the mud, and dirt, and rocks." One Kentucky participant expressed concerns that some surface mined areas have the potential for substantial slides that could be quite damaging:

> …It's literally about 50 feet from [the highway]. That's where the actual rubble is…It's loose, loose, rubble. In a huge storm event, that could completely decimate a major thoroughfare through that part of the state.

Economic/Occupational Wellness

Although the wellness wheel only listed "occupational" as an aspect of economic

wellness (See Appendix A), there was much talk about economics in the region across the groups. Due to the wider scope of the economic issues expressed in the focus groups, the word "economic" has been added to the title of this theme. Participants on both "sides" recognized the importance of coal for the economy and many saw no other options for work. The power that the coal industry has in this type of economic system also presents some issues mentioned by participants.

Coal is Economically/Occupationally Crucial in Central Appalachia (88 Quotes, 6 Groups, 19 Participants)

This sub-theme had more quotes than any other sub-theme. Most of these quotes came from pro-surface mining groups. Many participants asserted that coal mining is the main economic driver of the region and that without it, the economy would crumble. As a member of the pro-surface mining Kentucky group stated:

> If they didn't have [surface mining] around here, the people here wouldn't have no money. If it wasn't for the coal industry, everybody around here would be dirt poor and wouldn't have no shoes, because there ain't no other way for a man to make any money.

A participant in the pro-surface West Virginia group made a similar comment: "They are furnishing people jobs. I mean, that's the only kind of job in this state that pays anything. Why would you cut your own throat?"

Some participants asserted that the other businesses and organizations in the area would not be able to survive if the coal industry stopped operating mines: "That's another thing, I mean, you take coal business out then the schools are going to go out, the restaurants are going to go out, gas stations are going to go out, then what are y'all going to do?" (Pro-KY). Those in the

pro-surface mining groups saw surface mining as an integral part of the mining industry that sustains the region.

Those in the anti-surface mining groups also spoke to the powerful force that coal mining is in the economy of Central Appalachia: “It is astronomical the amount of the tax base that you would have to replace in this county [if coal was no longer being mined]” (Anti-VA).“They’ve got it sort of like a monopoly on this business of coal” (Anti-VA). “People are just out there trying to make a living for their family. And they say that’s all that’s around here” (Anti-KY).

Participants, particularly those in the pro-surface mining groups, talked more specifically about the lack of other gainful employment opportunities that exist in the coal-dominated Central Appalachian economic system. As one pro-surface mining Virginian described: “It’s just hard to go to another place, and when you get out of high school, you pretty much have a [mining] job and you can probably make $50,000.” According to this participant, coal mining not only pays well, but the alternative to coal mining is to move somewhere else to work. One pro-surface mining Kentucky group member put it this way:

> …People stay in the mines just because of the money. Yeah, you might could find a job at Wal-Mart…but it can't compensate for...say you got that house payment and a car. You lose your job in the mines, you can't survive making it at Wal-Mart.

Even the few other options that are available may not meet financial needs. As one West Virginia resident stated: “You almost have to be retired to live here. Unless you want to work in the mines.”

The anti-surface mining groups talked about the issue less frequently, but those who did mention it generally stated that lack of other employment options is a problem in the region:

"[Surface miners] want to hold on to jobs—I don't blame them. I was laid off a job for 18 months…I'd work too" (Anti-VA).

Participants further emphasized the economic importance of coal, recalling days of outmigration when coal production was down. Members of both group types talked about the history of outmigration in the area. One pro-surface mining Virginian stated:

> That's the reason most of our ancestors is in Ohio or Michigan or Washington, DC. Just anywhere you had a relative that had moved, that's where you went, because you had somewhere that you could stay a week or two until you got a paycheck.

Another pro-surface mining participant from Virginia talked about his experience leaving the region then returning when surface mining began to increase. He talked about what it would be like for him if this increase had never happened: "I'd be working in Chicago: that's where I left just before I came here. I'd have left mining and went there." This participant, like others, moved away for work and returned as soon as employment in the mining industry was again possible.

Pro-surface mining participants from West Virginia talked about how many people left their community when coal mining production decreased in the area: "You can go up there where I worked, and there's not even hardly evidence, and there were probably 1,500 guys that worked up there in that area. You can't even see the evidence." Several participants were able to recall being taught about outmigration as a necessity for survival or success. As one pro-surface mining West Virginia participant stated:

> There's an old saying in West Virginia, you either go coal mining, moon shining, or moving on down the line. And what we found out was, yeah, they're raising marijuana and moonshine, and a lot of people work in the coal mines. And all the people who can't

work and get decent jobs who finish high school or get a college degree leave the state. Participants remembered periods of outmigration due to changes in coal production or lack of opportunities in the region.

Several participants expressed fear that declines in surface mining would lead to another coal "bust" and another surge of outmigration. As one pro-surface mining Virginia participant stated: "Without the stripping…they'll be exodusing us out of here again like it was in the 50's and 60's." This feared outmigration would only add to already high levels of population loss brought about by the lack of economic opportunities in the region.

Some in the pro-surface mining Virginia group asserted that mining jobs are currently prevalent in the area: "If somebody doesn't have a job in this area, just about they don't want to have one." Similarly, "We're short of miners right now. I mean you turn on the local television and they'll probably be at least three mining companies advertising" (Pro-VA).

There was a good deal of difference in opinion among participants about the prevalence and availability of surface mining work. These variations arose even amongst pro-surface mining participants. A member of the pro-surface mining Kentucky group put it this way:

> …It's a lot harder to get a job on the surface. I've had my surface card for 12 or 13 years, and if you can't run a piece of equipment or you don't know somebody, you're not getting a job on the surface.

Anti-surface mining group members did not talk about this subtheme frequently, but those who did, argued that surface mining is not creating many jobs. An anti-surface mining participant from West Virginia stated:

> But the big story that they feed all the people is about jobs, jobs, jobs. And anyone who

> goes into the details about mining will tell you that it's at least 2 to 1, some people will say 3 to 1, jobs that are produced between surface mining and underground mining. For every ton of coal that's produced in surface mining, it would take 2 miners underground to produce that much, at least.

Another anti-surface mining participant, this one from Virginia, commented about the need for fewer workers on surface mining jobs: "Science and technology's took over the jobs and also took over the money" (VA).

Those Who Oppose Surface Mining Practices in Any Way Face Harassment and Threats (31 Quotes, 5 Groups, 11 Participants)

Perhaps directly related to beliefs about the economic necessity of coal in the region, participants who had spoken out negatively about surface mining reported that they were often met with an oppositional response and faced hostility from those who work in the coal industry. Participants who had openly opposed surface mining reported instances of harassment or threats. One participant whose family had fought against the surface mine near their home stated: "Well, when they were running their trucks and equipment over there…we would get run off the road, we would get held up, they would…make us late for work, we'd get threats" (Anti-KY).

A participant in the anti-surface mining WV group described the action mine employees took against one of her neighbors who stood in opposition to surface mining: "They put her picture up at the mine office and told them: 'This is the person that's trying to take your job.'" One retired miner from Virginia described the actions taken against him for speaking out against the surface mining near his home: "They threatened to put me in jail for speaking out against them trying to mine coal behind my house and blow my house down and destroy my home"

(Anti-VA). A participant in Kentucky and one in West Virginia mentioned that their children were called "tree-huggers" at school because of their opposition to surface mining.

Even some who supported the surface mining industry in Kentucky reported facing harassment when making complaints about practices on the surface mine near their homes. As one participant put it:

> The thing of it is, if you make those guys on the strip job above your home mad, they can make you live hard…You make them mad and you meet them coal truck drivers, they'll get you off the road.

Even though residents may support surface mining in general, they reported that speaking out against the mining in any way had potentially negative effects.

Those Who Oppose Surface Mining Do Not Have Political Representation (28 Quotes, 3 Groups, 9 Participants)

Participants in the anti-surface mining groups across states asserted that they do not believe that their opposition to surface mining has any political weight or that their complaints about mining practices are considered by those in power. In Virginia, participants talked about measures they had taken to protect themselves and their homes: "I met [the state politician] down here, I wrote him a letter …The only thing that come out of that was that he said that he didn't want to commit political suicide."

Another Virginia participant commented:

> The beliefs that we've had all of our lives that the government is there, they're here to help anytime…it destroys your belief in government, state and local especially. But it

> destroys your belief in the system that's supposed to protect you. It's supposed to step in when…they're destroying everything around you.

Those in the Kentucky and West Virginia anti-surface mining groups shared similar perspectives:

> It's probably not all areas of stripping and auguring that they have it, but this area back in here, your elected officials and everything else is for the coal companies… They don't care about people living down there...Now maybe in the heavier populated area it might be a little bit different. But they sure don't care nothing for us (KY).

In West Virginia, participants expressed frustration with governmental agencies designed to regulate the coal industry:

> By the action, the rudeness of the guy standing there, I thought surely that's the guy with the coal company. The DEP agent I thought was really nice to us. And I had it confused, the DEP agent was talking to us like we were nothing, fighting the coal company's battle with us, while the coal company guy seemed so calm and nice.

Emotional Wellness

Participants in both types of groups described considerable impacts of surface mining on emotional wellness. Although the anti-surface mining groups had the most to say about this topic, those in the Kentucky and West Virginia pro-surface mining groups also talked about how surface mining affected their emotional well-being. Those in the pro-surface mining Virginia group remained mostly silent about emotional effects.

Ambient Stress (28 Quotes, 6 Groups, 12 Participants)

Participants in both group types reported experiencing stress. Ambient stress refers to stress that arises from everyday living conditions (Cohen et al., 1986). Aside from anti-surface mining participants reporting experiencing ambient stress more frequently, there were no significant differences between groups in the types of everyday hassles reported. One stressor that was mentioned frequently was noise. "I hear them about 24 hours a day just about…that's the way of life in the coal counties" (Pro-VA). "If you ain't somebody that wants to get up about 6:00 every morning, it's really aggravating because they start about 5:30 every morning" (Pro-KY). "And now, right now, I don't know if I could sleep if it was quiet. Those coal trucks coming over there. Sounds like a metal basketball. Boom, boom, boom all night. 24 hours a day" (Pro-WV). "I actually liked those cold nights, we'd raise our windows and turn on the ceiling fans. But when the mining was ongoing you couldn't do that because all of that smell and that sound drifted into your bedroom" (Anti-VA). "And then the blasting, continuous noise, a lot of dust" (Anti-KY).

A few participants also reported ambient stress in relationship to coal truck traffic issues, having to haul water due to well pollution, and the lack of utility services and road maintenance in communities shrinking in size due to MTR. Also see the section on Dust in the Environmental Wellness section as dust contributes to everyday stress levels.

Powerlessness (31 Quotes, 5 Groups, 12 Participants)

Powerlessness was an emotion expressed across group types and one that was mentioned very often by those in anti-MTR groups. In the Kentucky and West Virginia pro-surface mining groups, participants expressed feelings of powerlessness because of the lack of other employment opportunities. Some of the quotes from Kentucky pro-surface mining group

members on the topic are as follows: “So you just about have to accept whatever they dish out to live around here.” “We have no other choice.” “But we just try to take it. Hoping that in about 15 years it just moves on by.” “Well, if you ain't got a job, you can't afford to take them to court.” Those in West Virginia commented similarly. “If you want to live and provide for your family, it's like they've got you.” “You might not like it, but you've got to do it.” One West Virginia pro-surface mining participant linked this feeling of powerlessness to absentee ownership of the land:

> A lot of people may say they're for [MTR], but they have to say that. They're forced to say it because they live on company property. Most of the people in this area do not own their property. It's owned by the coal companies and the land owners.

Those in the Virginia and Kentucky anti-surface mining groups also expressed feelings of powerlessness. Many of these participants have made efforts to fight the surface mining near their homes but do not believe that they have achieved much success. As one Virginia participant stated:

> I've filed I don't know how many complaints down there, and I've had hearing, after hearing, after hearing and it's always that same thing…They'll rule with the company every time.

Other Virginians shared similar feelings: “You're feeling like whatever you do is not going to make that big of a difference, and your voice isn't being heard.” “You'll get a form letter that says that they promote economics. So, where does that leave you at? The last two letters is expressly to the EPA. No response from them.”

An anti-surface mining participant from Kentucky expressed her feelings of powerlessness this way:

> It's like the law enforcement, all the enforcements and stuff like that don't care. They can get by with murdering people as long as it has nothing to do with hurting the coal. We could be murdered, and it wouldn't matter. Nobody would investigate it…Only thing I could hear them saying is, 'Well, they should have kept their mouth shut. Or, they should have sold out.'

These feelings of powerlessness might be best summed up by the following quote from the Virginia anti-surface mining group: "We cry, nobody hears those cries."

Fear/Anxiety/Traumatic Stress (27 Quotes, 5 Groups, 13 Participants)

Another emotion mentioned primarily by those in anti-surface mining groups was fear. Many of these feelings of fear were related to worry about the possibility of sediment pond breaks. Impoundment or sediment ponds are ponds built to store coal waste water or slurry (Coal Impoundment Location and Information System, 2009; Reece, 2006). "They're going to put three sediment ponds in, which is over ten million gallons of water in that narrow holler. Either one of them breaks, I'm gone. If it rains, I'm going to be sitting there scared to death that it's going to bust" (Anti-VA). Similar fears were expressed by this anti-surface mining West Virginian participant: "I really am scared especially since I have my little boy, because I'm like, what if the dam busts? I'm dead." Participants referred to the Buffalo Creek Disaster and were well aware of where impoundment ponds were located in and what the effects of a slurry pond break could be (Erikson, 1976). The Buffalo Creek Disaster was a massive flood in Logan County, West

Virginia in 1972 caused by the failure of a huge impoundment pond. This disaster resulted in over 100 deaths and in the destruction of thousands of homes (Erikson, 1976).

Similar fears were mentioned by pro-surface mining participants:

> Biggest thing here is impoundment ponds. They build these big ponds back in these hollers where nobody knows about. Billions of gallons of toxic water, and it's just an dam. Now, when those break, you have to be worried (Pro-WV).

Participants in both types of groups also reported fears related to blasting. As one pro-surface mining participant from Kentucky said, "[Blasting] even startles me and I ain't afraid of nothing." Anti-surface mining participants from Kentucky echoed this fear: "I think [the blasting] was scary for all of us."

Other fears in relation to surface mining and its effects were expressed. For example, this participant from the anti-surface mining West Virginia group talked about her fears after becoming ill from ingesting polluted water:

> And next day the doctor come in and [tearful] and my daughter and my daddy ended up coming in and talking to me and hearing the doctor say that I was walking around dead. That I was dying. And that really does something to all of us. We did call my mom and [son] and told them, and it really got scary...So I thought what's going to happen to my kids? It was just really scary…It's just a lot of fear.

Others expressed more general fears about multiple potential effects of surface mining: "And there are nights when I wake up, and I'm scared, and I think am I going to wake up tomorrow and they're going to be blasting the top of that hill? Is somebody going to run up here and poison my water system?" (Anti-WV).

For some the fear associated with MTR operations seemed to engender a traumatic stress response for participants. Although this type of stress was discussed less often, several participants talked about severe stress reactions. For some, blasting reportedly brought on this intense stress response. This type of stress was mentioned less frequently in the pro-surface mining groups, but there were no fundamental differences between types of groups in the comments that were made:

> And their blasting? It totally scares [my wife] to death…Because you don't know at that moment if they're going to let off that blast. You might be just sitting there…then all at once everything just goes to rattling. And that puts your heart into that racing mode right there (Pro-KY).

Others described even more intense reactions to blasting:

> My daughter's [sister-in-law] lived close by in this community, and my daughter told me this after her sister in-law-died…she said "Daddy, I firmly believe that blasting and dynamite killed [my] sister-in-law." She said "I've been to her house when they'd blast, and she'd go all to pieces." And so they found her dead one morning in bed (Anti-VA).

A participant in West Virginia talked about her father's reaction to an unexpected blast:

> …My dad had a heart condition anyway, and they're supposed to let off the warning signal before they blast. They're not supposed to blast after a certain time in the evening or on weekends. Well, it was like 7:30 that evening, my dad was getting out of the bathtub. They let off one of the loudest booms that they had done. He fell and took a heart attack (Anti-WV).

One participant described her mother's reaction to the blasting: "And then would come the

sirens, the sirens with the blast. And she'd sit there just watching. And it was like she was in total shock" (Anti-VA). Although these type of acute reactions may not happen to all those living near surface mining operations, they were reported by some participants.

Solastalgia/Sadness/Grief (15 Quotes, 4 Groups, 10 Participants)

Solastalgia is a term developed to describe place-based distress that is engendered by unwelcome environmental change (Albrecht, 2010). Those who remain in communities drastically altered by MTR may have feelings akin to homesickness even though they have not left home (Albrecht, 2006). Those in both group types mentioned experiencing sadness and solastalgia in relationship to surface mining. In the pro-surface mining groups, only the West Virginia group mentioned this emotional experience. One West Virginian put it this way: "You live in a town and you're buried there and your roots are there and they just bulldoze it all down and then tell you, 'now if you want to, you can move back.'" Another summed up his feeling of solastalgia: "But the home we knew is memory."

These feelings were expressed across the anti-surface mining groups. One Virginia participant described her experience of solastalgia in this way:

> What it does to human beings, it's the same thing they do to the earth. They destroy you. Your body, your soul, and your spirit are as destroyed as the land that they rip from you… And for some of us, it hurts. It literally hurts. But what you're mourning is a loss of an environment that is like home to us (Anti-VA*).[1]

[1] After the official anti-MTR focus group in Virginia, two participants stayed for another thirty minutes and continued to talk about the focus group topic. This information was also audio recorded and transcribed. Quotes from this extended portion of the interview are indicated by an asterisk.

Another participant from Kentucky began to cry as he described all he lost to surface mining: "Then one evening, I…lost everything I'd worked 39 years for. [We] didn't have but what was on our backs."

A West Virginia participant described the experience of her mother on the night that she died. Her mother had been displaced by surface mining and was living away from the home in which she had spent most of her life:

> The night my mom died, I held her head in my lap. She cried wanting to go home. I said 'mother, you are home.' And she said 'no, I'm not home. I want to go home.' That does a lot to you when you see your mom and your dad so pitiful when they worked all their life—good, strong, honest people. It's not just my parents that was done that way. It was my whole family and friends I knew and communities I knew.

For anti-surface mining participants and for pro-surface mining participants in West Virginia, changes to their home and community as a result of mining practices engendered grief and solastalgia.

Ambivalence (16 Quotes, 3 Groups, 5 Participants)

Ambivalence was a major theme in the pro-surface mining group in West Virginia. This is the only pro-surface mining group that expressed much ambivalence, but for them, it seemed to be a major struggle. Below are some of the ways they described these feelings: "I was an underground miner although I got family in surface. I don't like seeing the mountains tore up, but I don't like seeing families go hungry either." "I figure 85% of people that do surface work don't like tearing the mountains up. But it puts food on the table." "You have to survive. Regardless, you have to survive…" "…It has provided a living, but at the same time, it's destroyed. It's a

good and bad thing."

Some participants in the anti-surface mining groups also expressed ambivalence about surface mining:

> People disagree with the environmental effects of all of this to some degree or another, but they won't speak out against it because most people in this area have a conflict of interest. It's like me, for instance. My livelihood comes from my pension, hospitalization, from mining coal (Anti-VA).

This participant, along with other participants, depends on income from the coal industry at the same time that he disagrees with the industry's surface mining practices.

Anger (17 Quotes, 3 Groups, 7 Participants)

No participant in the pro-surface mining groups mentioned experiencing anger in relationship to surface mining, but this was a recurring theme in the anti-surface mining groups. A participant in the Virginia group described it this way: "I'd just really like to slap somebody. I'd really like to fight back…"Another participant from the Virginia group described experiencing similar problems with anger: "[I'm] Angry. Very angry. And upset to think that people could say their jobs, but what about your home and your job? What if I'd go and do that to them and their home?" Participants in the Virginia group described the chronic, lasting nature of their anger:

> Ask them where they live. Go ask any of these inspectors where they live. I'll guarantee you they're not within ten miles of no strip job. And the frustration, the anger, the emotional impact of knowing what it's doing to my grandkids… it creates so much anger and frustration and hatred that it works on you constantly.

Those in other groups also reported experiencing anger in relation to surface mining. One West Virginia participant expressed anger that he believes other West Virginians who currently support surface mining will be feeling in the near future:

> And we're angry. Do you get that? That we're angry? But the anger's going to come in about 20 years, is when the big anger is going to come—when coal is [gone]. That's when it's going to come. And those that are fighting us now are going to be the angriest. And those who are profiting from it will be gone.

Frustration and anger over a number of issues related to surface mining arose in each anti-surface mining focus group.

Cultural Wellness

Focus groups also addressed how surface mining affects the cultural wellness of those who live near it. Most definitions of cultural wellness state that this aspect of wellbeing involves being aware of one's own cultural background and aware and respectful of the cultural backgrounds of others (California State University, 2012; University of Miami, 2009). For the purpose of this research, the concept of cultural wellness also includes the ability to freely practice and maintain cultural traditions that increase an individual's sense of well-being. This aspect of the definition is consistent with other expanded definitions of wellness that include the ability to connect with one's own culture in meaningful ways (Pacific Lutheran University, 2013). Although most of the effects of surface mining on cultural wellness that were mentioned were negative effects, this was not always the case.

The Importance of Place (27 Quotes, 6 Groups, 14 Participants)

Participants talked about the importance of place in their lives. Many mentioned how

long their families had been in the region: “Most of us here…our families have been here since forever” (Pro-VA). This was also reflected on the demographic form that participants filled out. Many indicated that their families had been in the region for generations: “We're not nomadic people. We do not move. We're planted in the mountains” (Anti-VA*).

This rootedness in the region means that leaving the area either to find work or to escape environmental problems is either very painful for residents or is something they are unwilling to do: “The old saying goes there's no place like home, it's true” (Pro-WV). Another participant described this attachment to place in one of his neighbors:

> This lady had means and ways to go somewhere else and do more. [The reporter] asked her, “Why do you live in these conditions?” She said “I'm 87 years old. I was born in this house and want to die in it” (Anti-VA).

Those who do leave often return as frequently as they can:

> You know people that live here, just like me, I was in the service and all over the world just about, but I never wanted to be nowhere but here. And our people, culturally, you know this is our area, and we've lived here for generations, and we don't want to go nowhere (Anti-VA).

Others who left talked about their eventual return home: “I've been gone, I've lived all over the United States, and I've been back a few years now” (Pro-WV). Still others talked about the way those who had to leave for work in the past would return home as often as possible: “Every weekend buddy, 23 was full with all these hillbillies coming home” (Pro-WV).

When participants were asked why they stayed even when they were reporting access to few resources and were lamenting environmental destruction around them, often they answered

with just one word: “home.” This was the case across group types. Some participants from the anti-surface mining groups described in detail what it meant to them to live on their home place and how surface mining threatened that. As one Kentucky participant put it:

> My family’s been over there for a long time. We have a family cemetery that we cherish. My mom and dad's buried there, and there's those two valleys that come done on the sides of I, and it's right in the center. If we would have sold, every bit of that would have been piled up with rubbish (Anti-KY).

A participant from West Virginia described how place preserved her family’s traditions:

> And most everybody who lived up through there was kin. I had great grandparents, and grandparents, and aunts, and uncles, and cousins. All those people I was raised up with. We were a tight knit community. We just shared a lot of rituals that was among ourselves, like my great grandmother when a baby was born she always had to bath it first. After she passed away, my grandmother took that role. And she even bathed my first born, and to me that was really special. I can still see her little hands just trembling…That was good. That brought joy to me.

After surface mining came into the area, however, she reported that the family lost too much land to continue to live so close together and that they lost many of their cultural traditions. For those in Central Appalachia, land and a sense of place is an important part of and preserver of culture.

The Loss of Recreational Activities/Access to Common Grounds (22 Quotes, 4 Groups, 9 Participants)

Participants mentioned losing some of their ability to engage in recreational activities like hunting, fishing, collecting wild plants, and riding four-wheelers. Some of these activities also

provide supplemental income, extra food, or herbal remedies for clients which makes their loss even more of a blow. Fishing and hunting are activities that were mentioned often as being negatively affected by surface mining: "When they took the mountaintops off down there, the mountaintops next to the lake, the fish quit biting. You can sit there all night and not catch any fish" (Pro-KY). One participant mentioned fishing when describing the few recreational activities available in the area: "There's fishing and four wheeling, but that's half gone" (Pro-WV). Another participant described the loss of the crayfish he used to catch for bait:

> The other thing I was good at is catching crawdads. I'm a good crawdad catcher and I was a soft shell crawdad catcher. On the hot muggy nights during the summer, crawdads shed. They go to the shallow water and on the banks of the creek and they shed and they make great fish bait. So I used to get in the creek down here…and I could catch 2 or 3 hundred crawdads. You can't do that anymore. That has been wiped out (Anti-WV).

Participants also talked about how surface mining affects hunting: "It takes a real big toll on your hunting. It runs a lot of your game off" (Pro-KY). Another talked about hunting in connection with those who do the surface mining: "They're just destroying the state, but there's still many members of our family that's making a living. It's not their fault. They love to hunt too" (Pro-WV).

One important aspect of Appalachian culture has been the ability for people to roam freely across the land on which they live. For decades, this freedom of movement has been possible even though little of the land in Central Appalachia is actually privately owned by residents (Hufford, 2009). Participants report that surface mining limits access to this land which limits recreational activities. This opinion was mentioned by participants in both group types:

> We got something that nobody else has. And that used to be open range. Years ago, we would get on four-wheelers, jeeps, motorcycles…and ride to the tops of the ridges, go for miles, and just enjoy the breeze and look at the countryside. Oh, it was beautiful… And the coal [miners] just pass you and they wave at you and you just keep going. Very few places have things like that. It's coming to an end. I can see that.

A participant from the anti-surface mining group in Virginia described her use of common land as a child:

> I know they look at us and they say "You don't own that." I don't. It's true. It's where I grew up. It's where I roamed. It's where I went into the mountains to pick berries, it's where I went to the creek to play. There was crawdads, and minnows, and we'd roll up our britchy legs and get down in the creek to scoop them up…We would catapult across the water in that creek, get a pole and jump from one side to the other (VA*).

Another talked about how surface mining prevents her from gathering wild plants:

> …Coal mining practice destroys not just the land but entire communities and a way of life because we used to go in the mountains…go get herbs, bloodroot, ginseng…They take everything when they go there. They leave nothing (Anti-VA*).

A participant from West Virginia describes how the loss of land access limits his ability to collect wild ginseng: "Everyone who goes out ginseng-ing has a compacted area that they have to put more pressure on to try to 'seng and instead of one person 'seng-ing there, you've got 10, so it's depleted that way" (Anti-WV).

Stereotypes and Appalachian Culture/People (8 Quotes, 3 Groups, 6 Participants)

Focus group participants also mentioned how stereotypes about Appalachia affect them:

“But across this country the stereotypes of the Appalachian people are pitiful” (Anti-VA). Participants in both group types mentioned the often negative representation of Appalachians:

> I've been to the airport over there many times to pick up a congressman or senator and we'd come through and…you'd see those nice, brick homes that the miners lived in, and they'd say, ‘Where are these shacks on stilts and so forth?’ And I'd say, ‘those things left here in the 20's and 30's. They're not here. You're living in a dream.’ Well, I'd take them on every pig path in [Southwest Virginia], and at one time over in East Kentucky…and it was unusual to find those things that they were looking for. But when they did find it, that's where they took all of their pictures and got all of their information or interviewed all the people. They wanted a story. They didn't really want what was true (Pro-VA).

Members of the anti-surface mining groups made some connections between negative views of Appalachian people and the practice of surface mining:

> There's not many areas of our country that this type of devastation would continue to happen over a period of time like it has here…Our area's always been looked upon as uneducated people in the South, the Appalachian people, they're uneducated and we can do them anyway we want to (VA).

Another participant put it this way: “And [surface mining is] just because of the irresponsibility and the total lack of people thinking that we're not worth anything” (Anti-WV). As a participant in the Virginia group asked: “Does anyone care if you’re a dying breed?” (Anti-VA*).

Social/Community Wellness

Most of the effects of surface mining on wellness in this area are noted by anti-surface mining group members, though once again this is not always the case.

Community Benefit or Lack of Community Benefit from Coal Money (19 Quotes, 4 Groups, 8 Participants)

Opinions on the community benefit from coal money differed within the pro-surface mining groups. Those in the pro-surface mining Virginia group saw great community benefits from coal revenue: “Of course the economic impact on the community, taxes and so forth, it's just far reaching for the people here.” “They've done a lot of development. You can imagine what it would have been like without having these kind of jobs and stuff.” “The [coal company owner] gave 25 million to the college here, and then gave 20 million toward that 30 million convocation center.”

A participant from the West Virginia pro-surface mining group also mentioned coal severance tax as an important source of revenue: “There's a coal severance tax. And it comes from the coal mines. And this area is full of coal mines.” However, those in the pro-surface mining West Virginia group did not see this money as beneficial to their community:

> But all the coal mines started closing down and everything, and coal severance tax leaves the coal mines and goes down to Charleston. They are supposed to spend it in the communities where it's earned. It doesn't get there.

West Virginia pro-surface mining participants also discussed the lack of overall economic benefit from coal mining in their communities: “The grade school here has about probably 200 kids, probably about a 95% free lunch. Very, very economically depressed area.”

Those in the anti-surface mining groups expressed opinions similar to those in the pro-surface mining West Virginia group. Only participants in the pro-surface mining Virginia group mentioned economic prosperity in their communities as a result of revenue generated by coal

mining.

Community Discord (17 Quotes, 3 Groups, 8 Participants)

Community discord as a result of surface mining was mentioned frequently by those in the anti-surface mining groups, but only once in a pro-surface mining group. In this case, it was brought up in regard to the way surface mining is conducted in the Western U.S. The participant commented that "they don't have as many people against them out West." Those in the anti-surface mining group talked about ways that community discord affects them in their daily lives. One Virginia participant put it simply: "We don't have a sense of community." Another described the behavior of others in the community toward her family because of their stand against surface mining: "Like when our wheel came off when we was at the top of the mountain and at that time all the workers, coal truck drivers and all that was coming through there. Not one offered to stop and help us…" (KY). A participant from this group also described a common bumper sticker slogan in the area: "Save a coal miner. Shoot a tree hugger" (KY). A participant from the anti-surface mining group in West Virginia described the conflict between her and her neighbors because she opposes surface mining:

> I've had people call me and cuss me out wanting to know why I want to take their job. They're trying to pay their mortgages and my kids and your kids was friends in school, and I used to like your kids. It's mean. It's nasty.

Another participant from the anti-surface mining West Virginia group directly linked coal companies and politicians to the community discord that exists: "Well, they pit us between each other. They try to pit neighbors, even family against family. They go well she's trying to take your job. They'll point to you too!" Similarly,

> I don't think people realize that because there's just such an incredibly intense propaganda machine that says that if you don't completely support everything about the coal industry then you don't care about this region, that you don't care about anybody that's from here, that you're against this whole area (Anti-KY).

The mindset of people that leads to this community discord was described this way: "It's this totally black and white blanket-us vs. them" (Anti-KY).

Concern for Children/The Future (13 Quotes, 3 Groups, 5 Participants)

This subtheme was addressed by anti-surface mining participants only. These participants expressed worry and concern about what would happen to children in surface mining regions in the future. A member of the Virginia group put it this way:

> I've got 3 grandkids that live right below me…I can't stand the thoughts of dying without having done something to try and make it better for them. And to try to stop this total annihilation of our area (VA).

Those from other groups said similar things:

> I've gotten into arguments with people on-line…like that woman saying, 'We're trying to feed our kids.' I'm like, 'Well, I'm trying to make sure that my child can grow up in a healthy environment. I'm trying to look towards the future.' 'Well, the future for us is the next paycheck.' Well, the future for me is my child. When she grows up (KY).

Physical Wellness

Participants talked about several different ways that they believe surface mining affects physical health. Differences of opinion between group types existed for some health-related concerns but similarities between group types also occurred.

Increased Cancer Rates (22 Quotes, 5 Groups, 14 Participants)

Those in the pro-surface mining Virginia group argued that cancer rates in their area are related to factors other than coal mining; those in the other two pro-surface mining groups saw cancer rates as likely related to surface mining activities. One pro-surface Virginia participant talked about where she believes the problems with cancer in her family come from:

> My great, great grandfather he lived here whenever they first started mining, he lived into his 90's. My great grandmother lived here during the most horrible times of mining and she lived to be in her 90's. My grandmother moved away from here whenever she was about my age, and they've kind of come back and forth, but most of the time their life's been spent in Ohio. She's had cancer 3 times…and she spent most of her time in an industrial town in Ohio making anything and everything with all those fumes…But you look at the past, and I don't really think it is a mining issue.

Another pro-surface mining participant from Virginia pointed to the hereditary precipitants of cancer and away from mining activities: "I think it's as much hereditary. Cancers and other things, it's as much hereditary." Another participant from that group saw his family members' health related behaviors as the cause of illness: "I had mother, three sisters, two brothers all died with cancer, and they smoked."

Those in the pro-surface mining Kentucky and West Virginia groups believed that there was a connection between mining activities and cancer: "All of my family has died with cancer. My mom, my dad, my brother's got it, my sister's got it, my uncle's got it right now all through his body. It has to have something to do with [mining]" (KY). "My nephew at 14 got prostate cancer and they said it was from unsafe water" (KY). "In the holler where we live at, I could

name you 10 people that has passed away in the past 7 or 8 years. And I think [surface mining's] got something to do with it." (KY). "The incidence of kidney disease and cancers in this area is astronomical compared to other parts of the country" (WV).

Those in the anti-surface mining groups shared similar opinions about cancer's connection to surface mining: "And then I got lung cancer from it; I had the most of my lung removed" (VA). "My husband had [a specific type of] cancer…There are four within a half mile of my home. Three of those are identical diagnoses. Those should happen about one in 100,000 (VA). Another participant noted the high rates of cancer in very young children: "We've had two and three year olds with brain cancer. Kidney cancer" (WV).

Health Problems Related to Pollution/Dust (14 Quotes, 4 Groups, 8 Participants)

Only a few pro-surface mining participants mentioned this sub-theme. One member of the pro-surface mining Kentucky group mentioned health problems that he believed were related to mining activity:

> …I was sick for three or four weeks when I was younger because of bad water. And we lived close to where they were stripping, and I think it had something to do with it.

Those in the anti-surface mining mentioned a number of problems related to water pollution. One participant described an autoimmune condition that she contracted through the consumption of polluted water:

> They told me then that they knew what it was. It was the water because they had all the proof with what I was having that it was the water. Because I did cook with it, we drank it, we bathed in it, everything… He said what had happened was a medication that I was on and the toxins in the water counteracted and that was what was killing me (Anti-WV).

Another participant described having her water tested after her mother began to become ill: "And my mother was getting pretty sick and had the water tested, and it just wasn't fit for human consumption. Nobody's was up that hollow" (Anti-WV). Participants also described skin problems in relationship to polluted water:

> Yeah, there was a layer of gook in there. But when they pulled that pipe up out of that well and the pump, he had on shorts, and that stuff got on his legs and it about ate his legs off… He had a…flesh eating condition. I mean his legs looked awful (Anti-KY).

Several participants from each group type also reported health problems because of dust and air pollution. Those who mentioned these problems in both groups linked the health problems to surface mining: "It's a problem on my daughter because she's got breathing problems, and she's on breathing medicine and inhalers and everything" (Pro-KY). "Talk about inhalers and stuff. My son never did have breathing problems. We moved up there, his breathing got really bad. [My daughter's] did too" (Anti-WV).

Intellectual Wellness

Participants did not address intellectual issues very frequently, but one theme did emerge here.

The Nature of Education/Media in Central Appalachia (22 Quotes, 5 Groups, 8 Participants)

Some participants talked about how education is handled within the coal communities of Central Appalachia: "We don't college educate kids. Sacrifice to do that… we don't college educate children to go to work in the coal mines. That's a monoeconomy. That don't happen" (Anti-VA). A pro-surface mining participant expressed similar concerns:

> Not saying anything bad about anybody, but miners, guys that work in the mines all their life, they don't push to have their kids go to school and get a four year degree… (Pro KY).

Some expressed concern about the way that those children who do get a good education tend not to return to the area:

> So we educate them but we have no job for them, and we export the youth, [decreasing] population. Who does that make extremely happy? The coal industry. Because that's less people that they have to deal with…There's nobody's home to buy…You're no longer in their way to stop their destruction of your home or your community (Anti -VA).

Others talked about the difficulty in pushing one's children to get more education when a family does not have many resources:

> I don't want my kids to go underground. God knows I don't. If you want to put your kids through college, and the coal mines have gone done around here, and you can't work and make good money, your kid's not going to college (Pro-KY).

Some participants talked about their belief that teaching tends to be one-sided in the coal fields because of overwhelming support for the coal industry and how this prevents children from learning to think critically about their world:

> …As a teacher, the thing that you've got to do more than teaching your subject is teaching your kids to think. And there's only one way to do that. It's to give them two sides of things, fully, honestly, and let them present it themselves even and compare and contrast and put it together. It opens up the brain to both sides of judgment which is the

> key element of what's wrong here… So, what happens to the intellectual development when you can't hear two sides of anything? (Anti-WV).

Another participant put it this way: "They teach it in our school systems. They teach how good coal is" (Anti-WV). A participant from the Kentucky anti-surface mining group talked about his belief that the industry intentionally works to keep citizens from critical thinking on the issue:

> In the past 10 or 15 years, the coal industry has realized that overall this area is on an economic decline in terms of economically minable coal reserves…We've been going steadily downhill in employment numbers since World War two and now we're going downhill on actual coal production as well…So I think the industry knows that this is the last couple of decades probably of economically minable coal. So my personal opinion is that this incredibly intense pro-coal PR campaign is really to try to get every last drop. It's to try to push off any potential influence from the environmental side of things (KY).

A pro-surface mining participant talked about a perceived lack of intellectual freedom in the state of West Virginia:

> …Remember the guy we showed how to get in the back way to the strip mine? He was a professor at a University…He told us that he did an environmental study through the university, and he was told he could not release it. You cannot release an environmental study if you're a student or someone that's doing a study on the environment in West Virginia.

Discussion

Participants reported implications of surface mining on wellness in seven different areas. They spent a good deal of time discussing issues with environmental problems with surface

mining. Most groups cited several environmental problems with surface mining, except for the pro-surface mining Virginia group which mentioned very few. Economic issues were also heavily focused upon, especially in the pro-surface mining groups. While all groups seemed to recognize the coal mining is an important industry in the region, only the pro-surface mining Virginia group argued that surface mining has brought economic prosperity to their region. Five of the six groups talked in some detail about various emotional effects of surface mining. The powerlessness that many group members felt was one of the most striking of these effects. Again, the pro-surface mining Virginia group stood apart from most of the other groups, denying feelings of powerlessness and most other negative emotional effects. This same pattern holds true in the themes of cultural wellness, social/community wellness, physical wellness, and intellectual wellness. The majority of the groups saw negative effects in most of these areas, while the pro-surface mining Virginia group saw mostly positive effects or mentioned no effects at all.

In addressing the first research question, what effect does living in communities directly impacted by surface mining have on the overall wellness of residents? One could examine the data from 5 of the 6 groups and conclude that the effects of surface mining on overall wellness in Central Appalachia are overwhelmingly negative across most categories. Some in these groups argue that it is necessary for economic survival, but none seem to be arguing that it contributes to wellness otherwise. Negative effects on wellness generally mirror and extend those reported by a resident of surface mining communities in other studies, interviews, documentary films, and newspaper articles (Hendryx & Ahern, 2008; Osha, 2010; Reece, 2009; Stockman, 2004; Sutherland, Golden, Gilomen, & Rubin, 2010).

It is important to understand why these differences between the pro-surface mining Virginia group and the other groups might exist. It is possible that this group was simply more supportive of surface mining than the other groups. Indeed, their self-rated support of surface mining was the highest; however, it was not significantly higher than the pro-surface mining Kentucky group's. It could also be possible that the problems with surface mining in Southwest Virginia are not as pervasive or troublesome as they are in other states. This, however, also seems unlikely when one examines the responses of those in the anti-surface mining group in Virginia, a group held not many miles from the pro-surface mining Virginia group. The responses of the anti-surface mining group in Virginia were not significantly different than those of the responses of participants from other states.

Another possibility is that the difference between the pro-surface mining Virginia group and the other groups has something to do with issues of relative social power and access to resources. Although specific aspects of participants' occupations and social standing cannot be discussed here due to confidentiality concerns, participants from the pro-surface mining Virginia group did tend to live closer to amenities and resources, and to work in or to have retired from occupations that afforded them more social power and income. Their lack of feelings of powerlessness, in contrast to the presence of these feelings in every other group, supports this possibility. In addition, this group seemed to be the most suspicious of the researchers at the outset of the group and may have been more guarded in their responses. When the researchers arrived for this focus group, one of the group members asked: "Is this the tree hugger group?" In addition, participants stated several times throughout the group that they wanted us to hear the "truth" about surface mining before we talked to others.

The second research question is difficult to answer: do those for and those against MTR perceive the mental health effects of MTR differently? In the case of the Virginia pro-surface mining group, the answer is a clear yes. However, the differences between the other two pro-surface mining groups and the anti-surface mining groups was much less pronounced. Some differences did exist between group types. As far as emotional wellness, pro-surface mining participants did not mention that they experience anger in relationship to surface mining activities. In addition, there were some differences in social/community effects. Specifically, pro-surface mining participants did not talk about displacement and did not report community discord. Similarly, they did not mention problems with a lack of political representation as their local and state representatives are also typically pro-surface mining. Anti-surface mining participants expressed perceptions of the EPA and the Obama administration as not doing enough to regulate coal mining; those in all pro groups expressed the opinion that these agencies were doing too much to regulate mining. Finally, pro-surface mining participants did not express the same worries about the future of the region's children. Aside from these few differences, those who identified as pro-surface mining in these five groups and those who identified as anti-surface mining shared many of the same concerns although different groups spent more time and expressed more concerns about some issues than others.

The most important aspect of the answer to this question is the differences between group type in all but one group were definitely not as pronounced as one might expect from the way the media portrays the divide between coal field residents on this issue. One limitation of this study may also be illustrative as to why this divide typically seems so large. The setting for the Kentucky pro-surface mining group was a significant limitation. This setting was not a private

one (the group was held in a small room off of the back of a rural convenience store) and although only a few non-participants walked into the study area, these interruptions were enough to threaten participant confidentiality and comfort and may have been enough to alter research results in this group. Participants seemed softened or changed their opinions about mining greatly when a man dressed in a miner's uniform walked into the room. Participants may have shared less than they would have or may have shared different information than they would have had the location been more private. However, this limitation is illustrative because participants did not feel safe to express anti-surface mining sentiments publically. It may be the case that this fear is pervasive in the region and that even though many may hold more moderate opinions about surface mining, they are not comfortable voicing those opinions.

Limitations and Directions for Future Research

Probably the biggest limitation to this study was the absence of the voice of those currently working in the mining industry. Without the input of these residents of Central Appalachia, the picture cannot help but be incomplete. Future research on wellness and surface mining should provide enough safety to include the voices of current coal miners in order to provide a more complete picture. It may be necessary to conduct individual interviews with these participants to ensure that safety.

Another issue that could be seen as a limitation to this study is its breadth. The scope of this study was necessarily wide for two reasons. First, the stigma surrounding mental health prevented successful recruiting for a study focused solely on issues of mental health at this time. Second, the study was exploratory in nature; its aim was to establish or further establish the existence of effects of surface mining on wellness rather than to explore any of these effects in

depth. Future research will need to probe the various aspect of wellness more deeply as researchers have done with environmental issues and physical health effects. When specific problems are better understood, efforts to develop treatments for and solutions to these problems will be more effective. In addition, the more research we have about the human effects of surface mining, the more knowledge we can apply to the creation of policy changes to prevent these problems.

Another study limitation stems from the number and type of contacts that I had access to in order to recruit participants from the region. Most of these contacts were from the academic or activist realms and may, therefore, have connected me with different participants in Central Appalachia than other sources would have. Different recruiting approaches may have, therefore, produced different results.

Despite these limitations, the results of this study offer some important insights into the human impacts of surface mining. Although there were some differences between group types, and especially pronounced differences between the pro-surface mining Virginia group and other groups, the overall picture presented in the research results suggests significant effects of surface mining on wellness in most areas of wellness explored. The results of this study, in addition to the reports of community members elsewhere, suggest that more in depth research that leads to solutions in the areas of community and individual wellness as related to surface mining are greatly needed. Specifically, emotional wellness is a problem that has not been given much research attention previously but that has been mentioned at times by residents of surface mining communities (Biggers, 2011; Reece, 2006; Stockman, 2004). The information provided in these focus groups points to problems with solastalgia, anger, powerlessness, chronic stress, and

traumatic stress. Problems with emotional wellness are especially concerning as access to mental health care is limited in Central Appalachia (Zhang, et al., 2008). Emotional wellness deserves more research attention. Specifically, research that documents the prevalence of such problems in surface mining regions and the impact of these emotional experiences on the development of mental health disorders, such as major depressive disorder, post-traumatic stress disorder, and other anxiety disorders, is important. Further, the positive effects of surface mining on emotional wellness that may exist, especially for those who support surface mining and those who rely on it for income, should be explored.

CHAPTER II

LITERATURE REVIEW

Coal mining has been the major industry in much of Central Appalachia for over a century (Eller, 2008). According to the Energy Information Administration (2009), Central Appalachia is composed of the coal-producing counties in eastern Kentucky, eastern Tennessee, southwest Virginia, and southern West Virginia. Historically, most of this mining has been accomplished through underground methods, but in more recent decades, coal mining through the use of explosives and machinery on the earth's surface has become increasingly prevalent (Burns, 2007). Mountaintop removal coal mining (MTR) is a form of surface mining that is beset by controversy in the Central Appalachian region. Proponents of the process tend to emphasize economic benefits of MTR. High rates of unemployment and poverty have long been a problem in Central Appalachia, and coal mining of any type provides much needed employment opportunities (Appalachian Regional Commission, 2009; Housing Assistance Council, 2002). In addition, both underground and surface coal mining positions offer wages and benefits far better than those of most other available employment options (West Virginia Coal Association, 2010).

Superior miner safety in surface mines is another benefit cited by supporters of MTR. Although fatal accidents involving surface miners have been documented and some surface mining positions carry as high a risk of lung disease as underground mines, MTR is generally thought to be safer than underground mining (CDC, 2012; Harris, 1998; Smith, 2012; Walter, 2011; West Virginia Office of Miner's Health Safety Training, 2011). Supporters of MTR also argue that it can be undertaken without significant damage to local ecosystems and that reclaimed MTR sites provide flat land for projects such as golf courses, industrial parks, and

prisons that will enhance economic development (Kentucky Coal Association, 2008; West Virginia Coal Association, 2010; Zipper & Skousen, 1990; Zipper & Yates, 2009). Further, MTR supporters point to the tax revenues produced by the coal companies as necessities for the economic well-being of the region (West Virginia Coal Association, 2010).

On the other hand, opponents of MTR argue that it does little to improve the economic situation in Central Appalachia. Indeed, there is a correlation between high poverty rates and high rates of MTR in Central Appalachian counties (Epstein et al., 2011; Hendryx, 2011; Reece, 2006, 2009). In addition, MTR mining requires far fewer workers than underground mining because of the high degree of mechanization involved (Barrett, 2007). Surface mining is quickly catching up with deep mining in terms of number of mines and tons of coal produced by the mines (Burns, 2007; Kentucky Coal Association, 2008; West Virginia Coal Association, 2010). With MTR, decreases in mining employment are occurring even as tonnage of coal mined remains high (Burns, 2007; Lovett, 2011). Specifically, between 1985 and 2005, increases in mechanization for surface mining brought about a 56% decrease in Appalachian coal mining employment (Epstein et al., 2011). In West Virginia, the Central Appalachian state that produces the most coal, there were 125,669 coal mining jobs in 1948 and 168,589,033 tons of coal mined (Lovett, 2011). By 1978, the number of coal mining jobs had fallen to 62,982, and only 84,696,048 tons were mined. By 2010, only 20,452 coal mining jobs remained but coal production had risen to 144,017,758 tons (Lovett, 2011). 2012 figures indicate that out of about 22,000 direct mining jobs in West Virginia, only just over 6,000 are surface mining jobs (West Virginia Coal Association, 2012). These jobs make up 0.7-0.8% of the state's labor force

(Epstein et al., 2011). These figures make it difficult to argue that MTR is providing a sufficient number of jobs to improve the economic situation in Central Appalachia.

As for the promise of economic benefits to the region from tax revenues, the coal industry may not be delivering the economic advantages assumed to come in this form either. In Kentucky, for example, the coal mining industry actually cost the state 115 million more in 2006 than the coal industry contributed in state revenues (Epstein et al., 2011; Konty & Bailey, 2009). Similarly, researchers estimate that the coal industry cost the state of West Virginia $97.5 million in 2009 (McIlmoil, Hansen, Boettner, & Miller, 2010). Comparable patterns have been observed in Virginia (McIlmoil, Hartz, Hereford, & Hansen, 2012). Central Appalachian states support the coal industry by funding the maintenance of the roads on which coal is hauled, paying for the regulation of health, safety, and environmental impacts of coal production and use, training coal workers, conducting research and development for the coal industry, and providing coal education in public schools (Konty & Bailey, 2009; McIlmoil et al., 2010). In addition, millions of dollars of tax expenditures are made by states to subsidize the mining and use of coal (Konty & Bailey, 2009; McIlmoil et al., 2010). Although coal does provide jobs, tax revenue, and low electricity rates to Central Appalachians, these benefits are largely overshadowed by the cost of coal in regulatory and infrastructure expenses and state subsidies (Konty & Bailey, 2009; McIlmoil et al., 2010). Further, the opportunities for economic development on post surface mined land that proponents of MTR argue are beneficial for the region are not being taken advantage of on a regular basis. In fact, in the two most heavily surface mined states, West Virginia and Kentucky, only a small fraction of overall surface mined acreage has been developed for industrial use (Lovan, 2010).

In addition, the costs of MTR in terms of environmental and health impacts are beginning to be understood. Scientific research has uncovered clear evidence of harmful implications of MTR, such as water pollution, flooding, and forest loss, for the ecosystems in which it is undertaken (Palmer et al., 2010; Pond et al., 2008; Reece, 2006; Wickham et al., 2007). Moreover, research has begun to reveal negative effects of MTR on community life and culture in Central Appalachia. Some of these negative effects include the disruption of common activities such as hunting, fishing, and wild plant gathering; the literal loss of communities as people move away from mining sites; and the destruction of family cemeteries (House, 2011; Reece, 2009). Harmful health effects of the process on local residents such as increased rates of cancer, asthma, and kidney disease also have been documented (Burns, 2007; Hendryx & Ahern, 2008; Mountaintop Mining Overview, 2010; Woods, 2010).

Many Central Appalachian residents who live near MTR sites strongly support the coal industry and MTR, seeing any negative effects as necessary sacrifices for possible employment opportunities (Woods, 2010). Others living in communities directly affected by MTR oppose the process vehemently (Eller, 2008). Although local people in opposition to MTR have risen in increasing numbers since the exponential growth of the process began in the 1970s, many claim that the political process in these areas has been corrupted by the interests of powerful coal companies (Eller, 2008; Montrie, 2003; Shapiro, 2010). Some legal victories have been won and some mountains spared, but local and outside activists believe that they have been limited in their effectiveness by an entrenched political system that supports the interests of the coal companies (Baller & Pantilat, 2008; Eller, 2008; Fox, 1999; Montrie, 2003).

Despite the rich deposits of natural resources in the region and decades of economic success for the coal industry, the people of Central Appalachia have long been some of the poorest in the United States (Billings & Blee, 2000; Eller, 2008; Lewis & Knipe, 1978; Lichter, Garratt, Marshall, & Cardella, 2005; Woods, 2010). Some have gone as far as calling Central Appalachia an internal colony that has been exploited to provide natural resources for the rest of the country (Lewis & Knipe, 1978). The coal industry has long been the major economic engine of the region and an important source of employment (Thompson, Berger, Allen, & Roenker, 2001). However, coal mining is a monoeconomy in Central Appalachia, significantly limiting the possibilities for economic diversification and development of the region (Burns, 2007; Eller, 2008; Lewis & Knipe, 1978).

Following on the heels of generations of dependency upon the coal industry, some argue that MTR further exacerbates the negative effects of coal companies' absentee ownership of the land and of the region's natural resources (Eller, 2008; Montrie, 2003). For over a century, natural resources industries (primarily the coal industry) have dominated the economic picture in Central Appalachia (Burns, 2007; Pollard, 2005). The long history of reliance on coal in Central Appalachia has set the stage for the contemporary practice of MTR coal mining, despite claims of its environmental harmfulness and its potentially negative effects on the health of local communities. MTR is the latest controversial method of a powerful industry with a problematic history. The coal industry has an extensive record of labor practices that many would consider unjust (Fox, 1999). From coal camps that offered substandard living conditions at worst and paternalistic dependency at best, to fierce company opposition to unionization, to unsafe working

conditions and ongoing violations of safety standards, the industry has long held a controversial reputation (Blizzard, 2010; Burns, 2007; Caudill, 1962; Eller, 1982).

Labor injustices against those deemed less worthy in our society are not uncommon, nor are environmental injustices (Konisky, 2009). The literature on environmental justice documents many cases of minority groups in the U.S. bearing an unequal burden of the environmental costs of the nation's progress (Bullard, 2005; Shrader-Frechette, 2002). Although Appalachian people typically are not considered to be a minority group because of the large percentage of White inhabitants of the region, the same process of "othering" that renders certain groups of people worthy of discrimination in the public mind has been applied to Appalachians (Scott, 2010). The main difference between Appalachian people and other marginalized groups may be that social class is at the root of the "othering" of Appalachians, whereas other markers of difference, such as skin color, are often primary in discrimination against many minority groups. Stereotypes of the "hillbilly" and "redneck" have helped to camouflage the true nature of the economic situation in the region, creating a façade of personal responsibility for poverty in a region mired in systemic oppression (Fraley, 2007; Scott, 2009a, 2010). These stereotypes also have helped to justify the entrenched poverty of the region and the destruction of the land, portraying Central Appalachians as unworthy of the privileges to which many Americans are entitled (Barry, 2001; Hartigan, 2005; Scott, 2009b, 2010).

Although little attention has yet to be given to the mental health effects of poverty, discrimination, and environmental injustice in the region, emerging evidence suggests that MTR may have negative psychological effects upon those living in the shadow of MTR sites. One study by the Appalachian Regional Commission found higher rates of substance abuse and

mental health problems in coal mining regions in general than in the rest of Appalachia (Zhang et al., 2008). Another study compared the health-related quality of life for residents of MTR counties, counties with other forms of coal mining, and counties with no mining in Central Appalachia (Zullig & Hendryx, 2011). Residents of MTR counties experienced more days of poor physical health, poor mental health, and activity limitation, along with poorer self-rated health compared with residents of other county types (Zullig & Hendryx, 2011). In addition, personal reports of those living near MTR sites offer preliminary evidence that mental health problems such as traumatic stress symptoms, anxiety, insomnia, drug abuse, and depression may be widespread in these regions (Epstein et al., 2011; Reece, 2009; Stockman, 2004). Physical health effects of MTR also have the potential to impact the mental health of Central Appalachians. Residents see the increased incidence of serious illnesses in their communities and worry about the implications of MTR pollution on their own and their loved ones' health.

The sections below provide a more in depth-look at the process of MTR and its social, cultural, environmental, and health effects. Then, some of the potential mental health effects of MTR are explored.

A Closer Look at the Process and Effects of Mountaintop Removal Coal Mining

The process of mountaintop removal coal mining is just what the name suggests; mountaintops are literally removed to expose the coal embedded in the mountain for cheap extraction (Shapiro, 2010). MTR follows on the heels of more than a century of extensive deep mining in the Appalachian coalfields (Eller, 2008). Although other harmful but less impactful forms of surface mining, such as auger and contour mining, have been used for many decades in the Central Appalachian region, surface mining techniques, such as strip mining and

mountaintop removal, have become increasingly common and increasingly destructive since the 1970s (Burns, 2007; Eller, 2008; Montrie, 2003). Currently, about 40-45 percent of the coal mined in Central Appalachia is extracted through surface mining (Kentucky Coal Association, 2008; Perks, 2009; West Virginia Coal Association, 2013)

To date, over 500 mountaintops in Central Appalachia have been destroyed by MTR (Epstein et al., 2011; Harkinson, 2011; Perks, 2010). According to U.S. Environmental Protection Agency (EPA) estimates, by 2012, MTR projects in Appalachia are expected to have seriously damaged an area as large as the state of Delaware (Lovett, 2011; McQuaid, 2010). Robert F. Kennedy, Jr. went as far as calling MTR the "greatest environmental tragedy ever to befall our nation" (2009, p. 80). Although MTR may indeed be a national tragedy in terms of forest loss, loss of animal species, and pollution of some of the nation's cleanest water supplies, it is the people of the Central Appalachian coal fields who are bearing the weight of that tragedy. The basic steps of the process and some of its effects on the land and people of Central Appalachia are described below.

The Process of MTR

In MTR, one of the first steps in accessing the coal is to clear cut the forests that cover the mountains to be mined (Burns, 2007; Reece, 2006). After the trees are removed, explosives are used to loosen the rock and topsoil above a coal seam; coal companies term the material above the coal seam the "overburden" (Palmer et al., 2010; Reece, 2006). The excess rock and soil (which is called "spoil" after it is removed from atop a coal seam by explosives) is then pushed by enormous earth moving equipment or dumped by massive trucks into the surrounding valleys, creating huge "valley fills" (Epstein, 2011; Reece, 2006). In the 1980s, drag line mining

equipment was introduced, which allows for huge loads of "overburden" to be removed quickly (Burns, 2007). A dragline costs from $25-100 million and weighs about 2000 metric tons (Burns, 2007; Kentucky Coal Education, 2007). Draglines are some of the world's largest machines; the largest of them have the capability to lift several hundred tons of dirt in a single scoop, their buckets alone are the size of a two-car garage, and they can be as tall as a 20-story building (Kentucky Coal Education, 2007; Mitchell, 2006; Perks, 2009). The machines are so massive that they have to be brought in pieces and built on the MTR site (Burns, 2007). This type of machinery has enabled surface mining to increase significantly in scope; an MTR site can encompass an area larger than 10 square miles (Perks, 2010). Through this process, the coal seam is exposed and the coal can then be removed quickly, cheaply, and efficiently (Smecker, 2009). However, this efficiency for the companies that mine the coal comes at a high price for the ecosystems in which the mining is undertaken and for the people who live near MTR sites.

The Effects of Mountaintop Removal

Some of the most problematic effects and processes of MTR are outlined in the following sections. The problem of water pollution is one of the most serious and runs throughout several of the more specific processes described. Effects/processes covered in this section include clear cutting and the loss of forests, valley fills, flooding, blasting, acid mine drainage, slurry impoundments, coal trucks, health problems, loss of common grounds and recreational opportunities, loss of family cemeteries, community discord, displacement, and reclamation.

Clear cutting and forest loss. Sometimes the trees clear cut for MTR are sold for lumber, but more often they are simply burned or buried for quick disposal (Burns, 2007; House & Howard, 2009; Reece, 2006). Already, over a million acres of some of the most biodiverse

forests in the world have been destroyed or severely damaged by MTR (Hufford, 2009; McQuaid, 2009; Palmer et al., 2010; Perks, 2009; Reece, 2006). The loss of these forests has significant negative effects on wildlife and plant species (Reece, 2006). The woodlands of Central Appalachia make up the largest unbroken forest east of the Mississippi (LandScope America, 2011). Central Appalachian forests are known as mixed mesophytic forests, frequently supporting over 30 canopy tree species in a single forest site (Mountain Association for Community Economic Development [MACED], 2005). In its canopy and understory, the mixed mesophytic forest contains about 80 woody species (MACED, 2005). The overall species diversity of these forests is high; the forests are home to approximately 250 bird species, at least 3,000 native plant species, over 200 species of fish, and the most diverse population of salamanders in any temperate region worldwide (Epstein et al., 2011; LandScope America, 2011; Perks, 2010; Spadaro, 2009). Even the forests that are adjacent to areas clear cut for MTR are negatively affected as interior forests change in the types of plant and animal species they can support when they become edged by non-forested areas (Perks, 2009; Wickham et al., 2007).

Valley fills. Valley fills destroy the streams that they bury and also result in the pollution of secondary streams and rivers in which people swim and fish (Mountaintop Mining, 2010; Palmer et al., 2010). Valley fills can contain more than 300 million tons of mining debris and some extend downstream as far as six miles from the original mining site (Spadaro, 2009). Over 7000 valley fills were authorized for MTR and other strip mining operations in Central Appalachia from 1985 to 2005 (Lovett, 2011). Valley fills frequently bury headwater streams, creating significant disruption of the ecosystems of the buried streams and of the streams and

rivers that are fed by these headwater streams (Mountaintop Mining, 2010; Palmer et al., 2010; Pond et al., 2008; Reece, 2006).

The biodiversity of Appalachian headwater streams is very rich, second only to the tropics (Epstein et al., 2011; Morse, Stark, & McCafferty, 1993). Many of the headwater streams in the region are intermittent (water flow is periodic or seasonal and based on the presence of groundwater) or ephemeral (flow only in direct response to precipitation events) and are therefore argued to be of less ecological importance than perennial streams (McQuaid, 2010; Reece, 2006; U.S. Environmental Protection Agency, 2003). However, even when not inhabited by fish, these small streams are crucial for water quality and quantity, sediment control, and nutrients for the watershed downstream. They are also rich with macroinvertebrate species, such as several species of flies, which are integral to the ecosystem of the watershed (Shnayerson, 2008). These intermittent and ephemeral head water streams are often principally responsible for maintaining the health of river processes and habitats for considerable distances downstream (U.S. Environmental Protection Agency, 2003).

According to the 2005 U.S. Environmental Protection Agency (US EPA) environmental impact statement on mountaintop mining/valley fills in Appalachia, 1,200 miles of headwater streams in Central Appalachia were directly impacted by MTR between 1992 and 2002; since 2002, many more miles of Appalachian streams have been impacted (McQuaid, 2009; Shnayerson, 2008; U.S. Environmental Protection Agency, 2005). A 2010 study identified over 2,000 valley fills occupying a combined area of over 88 square miles in West Virginia alone (Shank, 2010). The study found that these fills resulted in the loss of an estimated 844 miles of

intermittent and perennial streams, over 94% of which occurred in the southern coal fields of the state (Shank, 2010).

A 2011 study released by the EPA identified five principle deleterious effects of MTR and valley fills on stream ecosystems. The effects they name are:

> 1. Springs and ephemeral, intermittent and perennial streams are permanently lost with the removal of the mountain and from burial under fill, 2. concentrations of major chemical ions are persistently elevated downstream, 3. degraded water quality reaches levels that are acutely lethal to organisms in standard aquatic toxicity tests, 4. selenium concentrations are elevated, reaching concentrations that have caused toxic effects in fish and birds, and 5. macro-invertebrate and fish communities are consistently degraded. (p. ii)

Legislation to regulate the mining industry and to protect the water of Central Appalachia does exist. The Clean Water Act of 1972 prohibits the dumping of industrial pollutants that would violate water quality standards into U.S. waterways (Perks, 2009). However, it does allow for the dumping of "fill material" into bodies of water. The 2002 re-classification of MTR "spoil" as "fill material" rather than as industrial waste basically legalized the dumping of MTR waste into waterways (Perks, 2009). The Army Corps of Engineers is responsible for granting permits for the discharge of MTR waste materials (Davis & Duffy, 2009; Mitchell, 2006). Under the Clean Water Act, two types of permits were granted until June of 2010. Prior to that date, permits for the discharge of fill materials that were expected to have no more than minimal impacts could be covered by nationwide permits. Nationwide Permit 21 was generally the permit associated with MTR activities (Davis & Duffy, 2009; Mountaintop Mining Overview, 2010). These nationwide

permits were less difficult and time consuming to obtain than were the individual permits required for any surface mining discharge activities that are expected to have greater than minimal impacts on U.S. waterways. Despite the deleterious effects of most MTR valley fills on water quality, almost all of the permits (90%) issued by the Army Corps of Engineers before June of 2010 were nationwide permits (Mountaintop Mining Overview, 2010). The use of Nationwide permit 21 was suspended in June 2010 until it expired in March of 2012 (Army Corps of Engineers, 2010). Those who apply for valley fill permits during the suspension had to apply for individual permits from the Army Corps of Engineers under the Clean Water Act (Army Corps of Engineers, 2010). However, 48 of 49 nationwide permits were reinstated in March of 2012 with some modifications (U.S. Department of Defense, 2012).

Flooding. The loss of trees and top soil on ridges through MTR increases the potential for flooding (Hufford, 2009; Negley & Eshleman, 2005; Stockman, 2004). The lack of groundcover results in the loss of natural flood protection, increasing runoff during heavy rains and creating the conditions for flash flooding (Burns, 2007; Epstein et al., 2011; Flood Advisory Technical Task Force, 2002; Lovett, 2011; Shnayerson, 2008). In addition, valley fills increase the risk for flash floods by burying headwater streams that would typically contain some of the rainwater. A clear risk of flooding following mountaintop removal and valley fill operations has been documented (Phillips, 2004).

Proponents of MTR point to local differences in precipitation to account for disparities in flash flooding between mined and nearby un-mined areas; research shows that this explanation, however, is highly unlikely (Phillips, 2004). Since 2001, at least seven periods of severe flash flooding directly related to MTR and other strip mining operations have occurred in the Central

Appalachian region (Spadaro, 2009). A 1999-2001 study for the EPA directly compared flooding in un-mined and valley filled areas of the Ballard Fork watershed in West Virginia (Messinger, 2001). This study found that peak flow following storms with heavy rainfall was greater from a watershed of a mountaintop removal coal mine than from an un-mined watershed. Run-off patterns from the valley filled watershed were negatively affected by soil compaction on the MTR mine site, by the low infiltration rate into the valley fill compared to the forested watershed, by storage of water in the valley fill, and by the absence from the mine of interception from trees and leaf litter (Messinger, 2001, p.1).

Reports from residents also highlight the seriousness of the problem (Osha, 2010). Maria Gunnoe and her family have been subject to flooding seven times in their Boone County, West Virginia, home since the MTR mine began operation behind their home in 2000 (Gunnoe, 2009). In the year 2001 alone, 500 West Virginia homes located near valley fills were destroyed in floods (Baller & Pantilat, 2007). Even increases in less severe flooding create problems for MTR community members who report being unable to cross frequently washed out roadways as a result of flooded creeks (Woods, 2010).

Blasting. The blasting that is done to remove the "overburden" often shakes people's homes, cracking foundations and walls, knocking items off of shelves, separating walls from floors, and damaging or breaking windows (Burns, 2007; Foster, 2006; Osha, 2010; Stockman, 2004; Thompson, 2009; Woods, 2005). The explosives used to remove the "overburden" are a mix of ammonium nitrate and diesel fuel, the same mixture that Timothy McVeigh used in the Oklahoma City bombing (Reece, 2009). However, these blasts are ten times stronger than the Oklahoma City blast and occur thousands of times a day across Central Appalachia (Reece,

2009). In addition, rocks, known as "flyrock," rain and roll onto communities near MTR sites. These rocks are sometimes the size of large boulders and have been known to destroy homes and, at times, to cost residents their lives (Bajpayee, Verakis, & Lobb, 2003; Hacettepe University Department of Mining Engineering, 1996; Morello, 2005; Stockman, 2004).

Residents close to MTR blasting operations are also plagued by the dust created by the process, which constantly coats their homes, vehicles, and lungs (Barry, 2011; Burns, 2007; Epstein et al., 2011).

Blasting not only endangers residents and their homes through property damage, flyrock, and dust, it also contributes to water pollution through the destruction of wells (Stockman, 2004). Underground aquifers are often cracked in the blasting process, allowing oil, gas, and sediment to leak into the aquifers and permanently contaminate the wells that they support (Blakeney & Marshall, 2009). Alternately, water can run out of cracked aquifers, causing wells to go dry. Thousands of family wells have been contaminated or dewatered as a result of MTR blasting (Kentuckians for the Commonwealth, 2011). Often, families in Central Appalachia depend on their wells as their sole water source (Blakeney & Marshall, 2009). Residents report that it is difficult to get coal companies to compensate them for the loss of their well water because of mining activities, and when such compensation does occur, its extent tends to be the provision of bottled water (Woods, 2010). Even when coal companies are required to provide drinking water for residents whose wells have been contaminated, residents are still often forced to cook with, wash their laundry in, and bathe in the contaminated water (Blakeney & Marshall, 2009).

Acid mine drainage. According to the U.S. EPA, acid mine drainage, caused when water flows over or through sulfur-bearing materials, is the primary pollutant of surface water in the

mid-Atlantic region (2011b). Acid mine drainage comes both from abandoned coal mines and active mining sites. The acidity of coal-mine drainage is caused primarily by the oxidation of the mineral pyrite found in coal, "overburden," and mine waste piles (United States Department of the Interior, 2010). Acid mine drainage has corrupted over 4,500 miles of stream miles in the region. Its effects include the loss of aquatic life and the restriction of stream use for recreation, public drinking water, and industrial water supplies (U.S. Environmental Protection Agency, 2011b).

Though treatment methods to decrease the impacts of acid mine drainage have been developed, the effectiveness of these methods is questionable. A 2010 study of streams in West Virginia found that both treated and untreated acid mine drainage streams had chemical environments that radically differed from streams not affected by acid mine drainage (Shank, 2010). In both treated and untreated streams, signs of "impaired ecosystem function and compromised biological integrity" were observed (Shank, 2010, p.7). Even when mining sites are "reclaimed," deleterious effects on water quality have been found to exist for decades following reclamation (Xinchao, Honghong, & Viadero, 2011).

Generally, state departments of environmental protection are responsible for monitoring abandoned mine sites and for making sure that water pollution from these mine sites is treated in accordance with Clean Water Act standards. The Surface Mining Control and Reclamation Act of 1977 established a reclamation fund to treat water pollution emanating from abandoned mines. However, money for the reclamation fund is provided by the coal industry and current rates of coal taxes do not sufficiently meet funding needs for this purpose (Epstein et al., 2011; Ward, 2009).

Slurry impoundments. After coal is mined, it has to be cleaned for market. What is left over after the coal is cleaned is a substance called slurry, a combination of silt, dust, water, bits of coal, and clay particles (Coal Impoundment Location and Information System, 2009). This slurry also contains carcinogenic chemicals used to process coal and toxic heavy metals present in coal, such as arsenic, mercury, chromium, cadmium, boron, selenium, and nickel (Sludge Safety Project, 2011). Slurry is stored in huge impoundments (Reece, 2006). The heavier debris settle on the bottom of these ponds forming a thick substance called sludge (Reece, 2006). There are currently about 700 coal waste impoundments in the United States, the majority of which are located in Central Appalachia (Coal Impoundment Location and Information System, 2009; Spadaro, 2009).

Many of these waste impoundments are constructed over the top of abandoned deep mines, creating the conditions for dangerous breakthroughs like the one that occurred in Martin County, Kentucky in 2000 (Epstein et al., 2011). During this disaster, 300 million gallons of sludge spilled, polluting more than 100 miles of streams, obliterating all life forms in these streams, and contaminating the water supply for over 27,000 people (Reece, 2006; Spadaro, 2009). The spill was 30 times the size of the Exxon Valdez disaster, though media coverage was far less extensive (Reece, 2006). Parts of Inez, the community in which the spill occurred, were buried under 7 feet of coal sludge (Coal Impoundment Location and Information System, 2009). Ultimately, the company responsible for the disaster, Massey Coal, was fined only $5,500 dollars in federal court (Blakeney & Marshall, 2009). More than 40 other spills of various sizes have been documented since the year 2000 (Burns, 2007 Coal Impoundment Location and

Information System, 2009). In addition to spills, these impoundments are notoriously leaky, creating the risk for water contamination even when a "spill" does not occur (Woods, 2010).

Coal slurry also is often injected into abandoned deep mines for storage where many believe it seeps into the groundwater through cracks and channels in the rock, polluting well water (Sludge Safety Project, 2011). A study was conducted in 2004 in response to the concerns of citizens in Mingo County, West Virginia who lived near a slurry impoundment using an underground injection system. These citizens complained of rapid corrosion of their plumbing fixtures, and red and black stains in their sinks and tubs, on their clothing, and on their dishes. They also reported frequent illnesses in their community including unusually high rates of cancer and kidney stones (Stout & Papillo, 2004). The study of all the wells within a two mile range of the impoundment revealed clearly poor water conditions; water contained excessive levels of many of the heavy metals associated with coal mining such as iron, arsenic, and manganese (Stout & Papillo, 2004). Such water conditions are not uncommon for those living in the coal fields of Central Appalachia (Blankenship, 2006; Karriker, 2006).

Coal trucks. No matter how coal is mined, it has to be transported to processing plants and to its buyers. Problems with coal trucks in MTR communities have been well documented. The constant traffic of coal trucks creates ongoing problems with dust and noise for MTR community residents (Burns, 2007; Epstein et al., 2011). In recent years, weight limits for coal trucks have increased, causing strains on bridges, damage to roads, and safety risks to other drivers on generally narrow and winding highways (Burns, 2007). Legal weight limits are frequently broken, increasing the risk of accidents (Reece, 2006). Accidents involving coal trucks and local residents have been far too common in the coal fields. They are so frequent that

there are attorneys in West Virginia who specifically advertise their services to those involved in accidents with coal trucks (Farmer, Cline, & Campbell, 2011; Rowe, 2011). Between 2000 and 2004, 53 Kentuckians were killed and over 500 were injured in accidents involving coal trucks (Reece, 2006).

Health problems. Pollution generated by coal mining (both MTR and underground mining) has been correlated with significant health effects for those who live in the coal fields (Hendryx & Ahern, 2008; Hitt & Hendryx, 2010). Some of the health effects documented include increased rates of hospitalization, pulmonary disease, hypertension, kidney disease, heart disease, and cancer (Hendryx & Ahern, 2008; Hendryx, Ahern, & Nurkiewicz, 2007; Hendryx, Fedorko, & Anesetti-Rothermel, 2010; Hendryx & Zullig, 2009). In West Virginia, women residing in coal mining counties are 16% more likely to give birth to low birth weight infants than those living in other West Virginia counties (Ahern, Mullett, MacKay, & Hamilton, 2010; Epstein et al., 2011). Further, poor birth outcomes are more elevated in MTR areas than they are in areas with other types of coal mining (Epstein et al., 2011). Recent research also has uncovered an association between residence in MTR communities and an increased risk of birth defects (Ahern et al., 2011). Six out of seven types of birth defects studied (circulatory/respiratory, central nervous system, musculoskeletal, gastrointestinal, urogenital, and 'other') were found to have higher rates in mountaintop mining areas than in non-mining areas (Ahern et al., 2011).

In addition, research has found an increased risk for cancer for those living in MTR areas. In the long term, drinking water polluted by coal mining processes can produce bone damage, cancers of the digestive tract, and liver, spleen, and kidney failure (O'Bryant, Edwards, Menon,

Gong, & Barber, 2011). A study comparing two communities in Southern West Virginia—the MTR community of Coal River and the community of Pocahontas, which is not in close proximity to MTR—found that those in Coal River were twice as likely to report having cancer than those in Pocahontas (Hendryx, Wolfe, Luo, & Webb, 2011). If this study's rates accurately represent the region, it would mean that there are an additional 60,000 people who have cancer in central Appalachian MTR counties (Hendryx et al., 2011).

Children in MTR regions of Central Appalachia reportedly suffer from negative health effects from coal dust such as asthma, severe headaches, mouth blisters, and frequent runny noses. In addition, those who are exposed to water contaminated by various MTR processes experience high rates of nausea, vomiting, and shortness of breath (Baller & Pantilat, 2007; Blakeney & Marshall, 2009). Residents report skin problems and other ailments as a result of using water polluted by mining, even for bathing (Blakenship, 2006; Blanton, 2009; Reece, 2006). Pollutants such as arsenic, which is commonly found in coal slurry, can cause neuropsychological deficits with long-term, low level exposure (O'Bryant et al., 2011). In some MTR communities, residents have to bathe their children in water that contains arsenic levels that are 130 times higher than the levels of arsenic deemed "safe" for drinking by the EPA (House, 2011).

Loss of common grounds and recreational opportunities. Residents of communities disrupted by MTR often lose access to de facto common land where they once hunted, fished, picked berries, dug ramps (wild leeks), and searched for ginseng and other medicinal herbs and edible plants (Burns, 2007; Foster, 2006; Hufford, 2002; Osha, 2010; Stockman, 2004). Though surface mining the land is the legal right of the mostly absentee landholders, it disrupts a culture

of common grounds that has developed over many decades in the region. When MTR operations move in, large areas once freely roamed become gated "no trespassing" areas (Stockman, 2004). For a people who spend much of their recreational time in nature, the pollution of streams and rivers that once provided swimming and fishing opportunities is a painful blow (Blakeney & Marshall, 2009; Foster, 2006).

In addition, hunting is very popular for both sport and sustenance in Central Appalachia. MTR has disrupted hunting activities for many mountain residents through both the loss of forests and the loss of common grounds (Lovett, 2011; Stockman, 2004). People in mountain communities who have gardened their whole lives for recreation and to help support their families often lose the ability to do so safely when MTR moves into the area. Residents report no longer having gardens because of fear of soil contamination (Gunnoe, 2009; Linville, 2006; Reece, 2006).

Loss of family cemeteries. Although there are laws protecting family cemeteries, these burying grounds have at times been destroyed, simply pushed into the valley fills with the rest of the "overburden" (Branham, 2008; House, 2011). At other times, the remains of family members have been disinterred and moved off of mine property to other locations (Burns, 2007; Young, 2008). Even those cemeteries that are left behind are subject to damage from blasting and difficult to access because of the mining surrounding them (Gibson, 2006; Reece, 2009). One resident of a small MTR coal mining community in West Virginia stated that in order to visit the gravesite of his uncle "he would have to make an appointment with a coal company, be certified in work site safety, don a construction helmet and be escorted by a coal-company representative" (Barry, 2011, p. 4).

Community discord. The conflict between those in the region who support the coal companies and those who oppose them because of the negative effects of MTR often creates insurmountable rifts in once tight knit communities (Blakeman, 2013; Osha, 2010; Smecker, 2009; Stockman, 2004). The Appalachian cultural trait of mannerliness may contribute to criticism against those who choose to speak out about MTR; these vocal residents are often viewed as ungrateful by other community members (House & Howard, 2009). In addition, many fear speaking out against coal companies when these companies serve as the sole employer in the region that pays a decent "breadwinner's" wage, no matter how few of those jobs are actually available to community members (Scott, 2007). Those vocal in their opposition to MTR have even been subjected to threats and violence at times by neighbors and coal mine employees who support the practice (Gibson, 2006; Gunnoe, 2009; Reece, 2006).

Displacement. Mountaintop removal is displacing families and emptying communities across Appalachia (Bonds, 2009; Coal River Mountain Watch, 2011; Hufford, 2009; Janofsky, 1998; Osha, 2010). This displacement is especially egregious when one considers the importance attached to place in Appalachian culture (Behringer & Friedell, 2006; Bonds, 2009; Hufford, 2009; Jones, 1994; Salyers & Ritchie, 2006). Coal companies often aggressively pressure homeowners living near proposed MTR sites to sell their land to the companies (Barry, 2001; Coal River Mountain Watch, 2011; Connor, Albrecht, Higginbotham, Freeman, & Smith, 2004). In addition, many coal field residents report that when coal company representatives offer to buy property they often ask the seller to sign a document stating that he or she will not speak out against company activities nor move back into the area (Barry, 2011; Ward, 1998). Residents of

MTR communities also have reported that houses bought by the industry often burn to the ground soon after they are sold (Karriker, 2006; Ward, 1998).

For those who withstand the pressure to leave, entrapment is likely to become a problem. Property values will fall, and as others leave the area, people will likely be unable to later sell their property at high enough prices to enable them to relocate to other areas (Fraser et al., 2005; Hufford, 2009). Some residents decide to move only after it seems that they can no longer stand the living conditions that the mining has created. Some who have experienced flooding fear that they could not survive another flood (Hufford, 2009; Price, 2008). Others state that they can no longer stand the constant dust generated by MTR (Hufford, 2009; Thomas, 2008). Some residents have compared living in MTR communities to living in a "war zone" (Linville, 2006, p. 37).

Coal company representatives are quick to point out that residents of MTR communities often come to them and ask them to buy their property and that coal companies do so to care for community members though they have no obligation to do so (Barry, 2011). Although coal companies have also argued that many residents in these towns are eager to move to areas that are more economically well developed, coal field residents often sell out because their way of life has been destroyed by the mining operation (Barry, 2011; Harkinson, 2011). In the documentary film, *Deep Down*, Beverly May is a coal field resident fighting an MTR permit in her community and states that community members are part of the coal companies' definition of overburden, simply part of what is in the way of the coal (Sutherland, Golden, Gilomen, & Rubin, 2010). Other residents share these sentiments, stating that the coal companies are trying

to make community residents "extinct" or that the coal companies view them as being of less value than the resources under the land on which they live (House, 2011; Karriker, 2006).

Reclamation. Some scientists claim that diverse and productive forests comparable to those existing before MTR mining can be developed on reclaimed mine sites (Wei, Wei, & Viadero, 2010). Soil composition, compaction, and erosion is drastically different following MTR mining, and there is little evidence that forests will again thrive in these regions. One EPA study in West Virginia examined 55 abandoned MTR mine sites ranging in age from 6-24 years following reclamation (US EPA, 2003). Overall, they found these sites to have many fewer trees and shrubs as compared to adjacent forests and to be lacking in biological diversity, often containing only 2 or 3 species of trees (US EPA, 2003; Perks, 2009). Colonization by native trees and plants is generally very slow because of the changes made to the landscape by MTR (Pond et al., 2008). Because the process of MTR is a fairly new one, it is unclear how many years it might take for forests to return to their pre-mining state or if it is even possible for this to happen at all.

Although laws requiring the reclamation of MTR sites exist, these laws are not uniformly enforced and reclamation practices often fall far below required standards. The main statute created to govern MTR mining and reclamation is the Surface Mining Control and Reclamation Act of 1977 (SMCRA) (Montrie, 2003). Under this law, coal companies are required to reclaim surface mined land and to return the land to its "approximate original contour" (Burns, 2007; Perks, 2009). To do this, the companies are supposed to backfill and re-grade the land to closely resemble its pre-mining appearance (Lovett, 2011; Perks, 2009). In addition, SMCRA requires mining companies to save and replace the topsoil moved in MTR mining (Lovett, 2011). Very

few, if any, MTR mining operations actually comply with the requirement to save the topsoil (Lovett, 2011). As mentioned above, topsoil removal and compaction make reforestation on abandoned mine sites very difficult, if not impossible. Often, mining companies simply use a hydro-seeding process to deal with revegetation of the mine site (Lovett, 2011; Perks, 2009). This process involves spraying a mixture of non-native grass seeds, fertilizer, and cellulose mulch on the exposed rock. Mining companies typically spend about 0.6 percent of mining revenue on reclamation (Perks, 2009).

As an alternative to reclaiming the land, coal companies are permitted by law to make the land flat so that it is suitable for economic development (Burns, 2007; Eller, 2008; Lovett, 2011). Though coal companies frequently choose this option, little development has occurred on these manufactured flat lands. MTR mines are often located in remote areas that are not suitable for industrial development (Eller, 2008). The water pollution that typically occurs as a result of MTR also poses a problem for future development of the abandoned mine lands (US EPA, 2005; McQuaid, 2009; Shnayerson, 2008; Stout & Papillo, 2004). To date, economic development has taken place on less than 5% of the abandoned MTR sites in Appalachia (Perks, 2009).

Mental Health and Mountaintop Removal

The process of MTR, as outlined above, is fraught with problems in many realms—environmental, social, economic, and health—which may contribute to poor mental health outcomes for people directly affected by it. In addition, it could be argued that the existence of MTR in Central Appalachia is possible only because of longstanding social problems such as poverty and discrimination that also tend to produce mental health difficulties. Prevalence rates for serious psychological distress and major depressive episodes are higher in Central

Appalachia than they are in other sub-regions of Appalachia (Zhang et al., 2008). Some of the mental health problems in Central Appalachia may be related to a sense of loss associated with rapidly changing ecosystems, landscapes, and communities. In addition, many of the mental health problems in the Central Appalachian region may be related to the chronic stress accompanying poverty and environmental problems. Stress has been shown to be linked to both depression and anxiety (Carlson, 2010; Lupien, McEwen, Gunner, & Heim, 20/09; Sapolsky, 1998). MTR is linked to stress, but no study to date has shown a link between MTR and mental health problems (M. Hendryx, personal communication, August 2, 2011). In the sections below, some of the possible negative mental health implications of MTR for those living near these surface mining sites are described.

Solastalgia: Grief as a Result of Changes in Place

As mentioned above, some residents of MTR communities are forced to leave their home place altogether. Although company supported relocation may seem like a viable and acceptable option for those living adjacent to mining activities that present hazardous and unpleasant living conditions, many residents of Central Appalachia and other rural areas have a connection to place that makes such an option highly undesirable (Connor et al., 2004; Jones, 1994; Salyers & Ritchie, 2006; Wakefield & Elliott, 2000). Those forced to leave the region are likely to experience a significant sense of loss (Feather, 1998; Lantz & Harper, 1989).

Others remain in communities that are forever changed by the process of MTR. Their very landscape is altered and they may no longer know what to expect from their environment (Albrecht, 2010). The world around them looks different, they can no longer count on access to clean water, they experience unusual patterns of flooding, the types of wildlife that the

ecosystem can support have changed, and they may not be able to participate in the recreational activities that the ecosystem once afforded them. In short, their sense of place has been undermined; even though they have not left home, home has become unfamiliar (Albrecht, 2010). Central Appalachians who remain in communities drastically altered by MTR may experience feelings of homesickness without ever leaving their homes (Albrecht, 2006). Solastalgia is a term that was coined to describe this place-based distress engendered by unwelcome environmental change (Albrecht, 2010; Albrecht et al., 2007). This "homesickness" may escalate into more serious problems such as drug abuse, physical illness, and depression (Albrecht, 2010; Speldewinde, Cook, Davies, & Weinstein, 2009).

Anecdotal reports do suggest that unwelcome environmental change can have serious effects on residents' mental health. For example, one resident of an Eastern Kentucky coal mining community died by suicide on Christmas morning in 2001(Moore, 2005; Reece, 2006). Blasting had destroyed the foundation of her home and flooding had destroyed her garden four times in the same season. Her husband wrote a letter to the local newspaper in which he stated that his wife had begged the coal company to at least replace her garden but she had received no help. He wrote that his wife stated in her suicide notes to her family members that the burdens of life had become too much for her. He believed that if the mining had never begun above their home, she might still be alive (Reece, 2006). Although anecdotal reports support the idea of mental health problems resulting from environmental devastation, empirical evidence of this pattern is lacking.

Most of the research to date on the psychological distress produced by environmental changes has been conducted in Australia. Some of the changes currently occurring there are

analogous to those happening as a result of MTR in Central Appalachia. In Australia, a form of coal mining known as "open pit mining" has characteristics that mirror the effects of MTR in Central Appalachia such as land clearing, blasting, water pollution, and increased train and truck traffic for coal transport (Connor et al., 2004; Higginbotham, Connor, Albrecht, Freeman, & Agho, 2007). As in Central Appalachia, the scale of coal mining in the Upper Hunter Valley region of Australia has greatly increased in recent decades because of the growth of the practice of open pit mining, a form of surface mining (Connor et al., 2004).

Research with residents of communities directly impacted by open pit mining illuminate community members' experience of distress as a result of changes to place (Connor et al., 2004; Moffatt & Pless-Mulloli, 2003). Community members report grief resulting from the loss of, or damage to, their homes, farms, creeks, watersheds, and landscape. They report disruptions in their sense of place and feelings of loss surrounding their community heritage and way of life (Albrecht et al., 2007; Connor et al., 2004; Higginbotham et al., 2007).

Research on other forms of environmental problems, such as pollution from toxic waste dumps, soil pollution, industrial activity, and technological accidents reveals similar effects on people living in close proximity to the problems (Baum & Fleming, 1993; Downey & Van Willigen, 2005; Vandermore, 2008). In addition, studies of natural disasters and forced relocation have documented feelings of grief, loss, and mourning because of the loss of one's home place (Rogan, Connor, Horwitz, 2005). Although such distress has been well documented, little empirical evidence exists that links these symptoms of grief and loss resulting from problematic environmental changes to more serious mental health problems such as depression.

Stress

The current prevailing model of psychopathology is the biopsychosocial model (Engel, 1981; Smith, 2002). This model regards mental health problems and disorders to be the result of an interaction of an individual's biological predisposition, sociological context, and "environmental" stressors. The term "environmental stressor" has been coined to describe stressors that have their source in environmental conditions. It does not necessarily refer to environmental problems such as pollution; rather, it is a more general term describing any aspect of an individual's surroundings that produces stress (e.g., noise, traffic congestion, neighborhood factors). To differentiate this generic term from more specific descriptions of environmental pollution, I place the term "environmental stressor" in quotes throughout the remainder of this document. In the sections below, I examine the effects of sociological context and "environmental stressors" on the mental health of Central Appalachians living in close proximity to MTR. In addition, I outline the physiological effects of stress on health and mental health.

"Environmental stressors." Grief about changes in place and loss of ecosystem health is often compounded by worry about the impact of mining on physical health for residents living near MTR mining operations (Connor et al., 2004; Higginbotham et al., 2007; Moffatt & Pless-Mulloli, 2003). Residents also experience the stress that comes with MTR blasting, both from the startling noise that accompanies the process and from worry about damage to their homes and wells from blasting (Epstein et al., 2011; Stockman, 2004). In addition, those who have experienced flooding from MTR activity experience stress and worry about future flooding (Gunnoe, 2009; Stockman, 2004).

Stress is a well-documented effect of environmental problems of many types (Baum & Fleming, 1993; Downey & Van Willigen, 2005; Luginaah, Taylor, Elliott, & Eyles, 2002; Wakefield & Elliott, 2000). There are four basic categories of "environmental stressors": stressful life events, cataclysmic events, daily hassles, and ambient stressors (Cohen et al., 1986). Stressful life events are major events in one's life such as the birth of a child, a divorce, the loss of a job, or the death of a loved one (Cohen et al., 1986). Daily hassles are defined as typical life events that cause frustration or irritation such as issues at work or an argument with a friend (Cohen et al., 1986). Natural disasters (cataclysmic events) are generally acute (typically lasting a few days at most) and tend to produce devastating initial effects (Baum & Fleming, 1993; Cohen et al., 1986). Although some of the stressors associated with MTR could certainly be categorized as daily hassles or stressful life events (loss of a family member because of cancer), or cataclysmic events (floods), the stressors produced by MTR can best be conceptualized as ambient stressors (Boardman et al., 2008). Human-made environmental problems like MTR tend to produce health effects and problems that are slow to develop, produce a good deal of uncertainty because of the possibility of highly variable health effects, and produce risk stretching out over long periods of time (Baum & Fleming, 1993). The uncertainty and loss of control associated with such problems tend to create the prime conditions for chronic stress (Baum & Fleming, 1993). Ambient stressors are chronic, pervasive, intractable, and aversive conditions of the environment to which people must adapt (Boardman et al., 2008; Campbell, 1983; Cohen et al., 1986; Topf, 2000). This ambient stress can have serious implications for both mental and physical health.

How stress affects health. In this section, I examine the general health effects of stress. This is an important focus in research on mental health and MTR because many of the health problems linked to MTR may be exacerbated by chronic stress.

The body's stress response is designed to be adaptive and to increase chances of survival (Beck, 2007; Sapolsky, 1998). When a stressor is perceived, the body initiates a physiological response, mobilizing the body's energy resources to prepare it to respond to the stressor (Beck, 2007; Carlson, 2010; Sapolsky, 1998). Hormones such as epinephrine, norepinephrine, and cortisol influence glucose metabolism, increasing blood flow to the muscles by increasing heart rate and blood pressure so that energy is supplied for strenuous exercise (Beck, 2007; Carlson, 2010). The sympathetic nervous system is responsible for initiating the stress response; it prepares the body for action by dilating the pupils, inhibiting salivation, accelerating the heartbeat, inhibiting digestion, and stimulating secretion of epinephrine (Sapolsky, 1998). When the body is thus responding to stress, long term processes that would take energy away from the stress response are attenuated. Processes such as immune system functioning, growth, digestion, and reproductive functioning are paused by the parasympathetic nervous system. This system helps the body to return to homeostasis after the stressor abates by constricting the pupils, stimulating salivation, slowing the heartbeat, and stimulating digestion (Lupien, McEwen, Gunner, & Heim, 2009; Sapolsky, 1998).

Although this physiological stress response is designed to increase a person's chances for surviving dangerous situations, chronic stressors result in overexposure to stress hormones, which can have numerous deleterious health effects (Taylor, Repetti, & Seeman, 1997). Some of the negative health implications of chronic stress include immune suppression, high blood

pressure (which can lead to heart disease, heart attacks, and stroke), digestive problems such as colitis and gastric ulcers, slowed tissue repair and regeneration, infertility, inhibition of growth in children, and fatigue (Beck, 2007; Carlson, 2010; Sapolsky, 1998). In addition, prolonged exposure to stress hormones, both prenatally and throughout the lifespan, can damage the brain, which can lead to memory and learning problems and increased risk of anxiety and depression (Carlson, 2010; Lupien et al., 2009; Sapolsky, 1998).

Physiological and psychological concepts of stress. Stressors, such as those associated with MTR, do not equally affect everyone exposed to them. There are two main ways in which stress is conceptualized: the physiological perspective and the psychological perspective (Cohen et al., 1986). The physiological perspective, first promoted by Walter Cannon and Hans Selye, focuses upon the body's reaction to noxious stimuli (Cohen et al., 1986; Sapolsky, 1998; Selye, 1973). In this approach, when the body's homeostatic balance is compromised by stressors, the body must work to deal with the stressor and then regain equilibrium (Sapolsky, 1998; Selye, 1973). A wide array of stressful inputs affects the body in similar ways (Cohen et al., 1986; Sapolsky, 1998; Selye, 1973).

In the psychological perspective, the body's physiological reaction to stressful stimuli is still recognized, but an emphasis is placed upon the meaning the person gives to environmental events along with personal appraisal of the ability to cope with environmental events (Cohen et al., 1986). Even the anticipation of a stressful event can initiate the body's stress response (Lupien, McEwen, Gunner, & Heim, 2009; Sapolsky, 1998). Perceptions of changes in the environment and coping responses to these changes are what ultimately determine many of the

effects of environmental problems for those individuals who experience them (Boardman, 2008; Cohen et al., 1986; Sapolsky, 1998).

Feelings of powerlessness and the loss of control can have especially pronounced effects in terms of the stress response. Residents of open pit mining communities and of other communities subjected to similar environmental stressors often report feelings of powerlessness to prevent the mining or industrial activity from occurring (Albrecht, 2010; Connor et al., 2004). On the other hand, environmental pollution may have very few stress effects on individuals who view the presence of the industry in question as positive for the community; this may be especially true for those who are employed in the industry and therefore derive their livelihood from it (Kazis & Grossman, 1982). However, at least one study on a related issue calls this assumption into question. In research on heavy industrial activity and environmental stress, Boardman (2008) found that men employed in manufacturing jobs who had children and were living near heavy industrial activity experienced distress as a result of living in proximity to this activity.

SES and stress. For those working MTR jobs, the availability of any job at all may serve as a buffer to stress in a region in which jobs are so scarce. The people of Central Appalachia are generally of lower socioeconomic status than the average American; this region lags behind much of the rest of the county in terms of education, income, and employment rates and experiences higher poverty rates (American Psychological Assocation, 2007; Appalachian Community Fund, 2008; Billings & Blee, 2000; Eller, 2008). This is especially true in coal mining areas and is most pronounced in MTR areas (Epstein et al., 2011; Reece, 2006, 2009). Socioeconomic status can have pervasive effects both on a person's likelihood of being exposed

to environmental problems and on the likelihood of successfully coping with this exposure (Boardman et al., 2008). Poor and minority populations in the U.S. are exposed to environmental toxins at higher rates than those of more privileged statuses (Evans & Kantrowitz, 2002). For example, toxic waste dumps are more likely to be located near low-income and/or minority communities, uranium mining is done exclusively in Native American reservations, and low income children are more likely to be exposed to toxins such as lead than children whose families fall into higher income brackets (American Psychological Association, 2002; Evans & Kantrowitz, 2002).

The fact that MTR sites are located in Central Appalachia has much to do with the large deposits of coal there. However, MTR mining in this region is also made possible by the socioeconomic position of the people who live there; people with fewer economic and educational resources are often not given the political voice to oppose harmful industries or may be so desperate for decent employment that they do not believe that they can speak out against MTR (Bullard, 2005; Scott, 2007; Shrader-Frechette, 2002). Over the past two centuries, the region and its people have been exploited for the valuable natural resources available in the Central Appalachian Mountains (Eller, 2008; Lewis & Knipe, 1978). The monoeconomy of coal has prevented the economic development of the region, leaving the people of the area economically disadvantaged and having lower SES than many U.S. citizens in other regions (Eller, 2008; Lewis & Knipe, 1978).

SES, stress, and health. Research has consistently shown that those of lower socioeconomic status and those of minority status have poorer health outcomes than those who are more economically advantaged and White in U.S. society (Baum, Garofalo, & Yali, 1999;

Pearlin, Schieman, Fazio, & Meersman, 2005; Taylor & Repetti, 1997). Because differences in people's health correspond to inequalities in their socioeconomic status locations within unjust social systems, one can think of health itself as stratified (Pearlin et al., 2005). Some of these disparities are likely to be the result of the toxic conditions to which many disadvantaged groups are exposed (Bullard, 2005; Shrader-Frechette, 2002). Other reasons cited for these inequalities include lifestyle differences (e.g., increased rates of smoking in low income groups) and unequal access to healthcare (Baum et al., 1999; Pearlin et al., 2005).

Although these explanations of health disparities are reasonable, differential exposure to stressors in general may offer a more complete explanation for these disparities (Baum et al., 1999). Those belonging to disadvantaged economic groups and racial minority groups are likely to be exposed to a stress load much greater than those with more advantages and coping resources. Disadvantaged groups often experience stressors that are chronic, repeated, and severe (Baum et al.,, 1999; Pearlin et al., 2005).

In sum, the situation in which many of low socioeconomic status find themselves is one of stress proliferation (Pearlin et al., 2005). This term was coined to describe the tendency of serious stressors to give rise to additional stressors. Exposure to toxic conditions is one of many stressors with which those of low SES and minority status must cope. Worry about the potential health effects of environmental problems increases stress; this stress, in turn, has many of its own harmful effects on health (Moffatt, et al., 1995). In the case of Central Appalachia, MTR mining heaps another severe stressor on residents who are typically already dealing with difficulties such as high rates of poverty and unemployment, lower levels of education, less access to quality medical care, and poorer health. Not only is MTR and the resulting pollution and change in the

local ecosystem added to already prolific stressors, MTR also, as discussed above, oftentimes undermines one of the most important coping resources available to residents of small rural mining communities—close knit social support networks. The importance of social support in coping with stress is explained below.

Stress and coping. Long term exposure to stressors can lead to problems with both physical and mental health. As stated earlier, those of lower socioeconomic status are likely to experience a great number of stressors, including the stress of being exposed to environmental toxins. They also tend to have fewer resources available to them to serve as buffers to environmental and other types of stressors. Problems stemming from the lack of financial resources are compounded by community problems in low SES areas. For example, limited access to transportation, resources, work options, and recreational opportunities take a toll on coping ability (Taylor et al., 1997).

In addition, community divisions come about as people take different sides of the issues, some supporting the industry's involvement in their communities and some opposing it (Bell, 2009; Wakefield & Elliot, 2000). Further, outmigration as a result of MTR areas also disrupts social support networks. The social support that is often available in small mountain communities can be undermined by industrial involvement, depriving citizens of yet another coping mechanism. Social support is among the most important resources for coping with chronic stress, making loss of this support especially problematic (Baum & Fleming, 1993; Boardman, 2004). People living near MTR sites are exposed to chronic environmental stressors and often may feel powerless to change their situation. Coping resources that are already taxed by low socioeconomic status are further compromised by community disruption. This

combination of chronic stress, feelings of powerlessness, and compromised coping ability creates the conditions for stress to take a heavy toll on the physical and mental health of Central Appalachians. Because chronic stress is associated with depression and anxiety, it follows that there may be higher levels of depressive and anxiety disorders in MTR communities (American Psychological Association, 2013).

Posttraumatic Stress Disorder

According to the most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000) at the time of this writing, Posttraumatic Stress Disorder (PTSD) occurs as result of exposure to an event that involves the threat of death or serious injury or another threat to one's physical integrity. It also can occur as the result of the witnessing of the death, serious injury, or threat to physical integrity of another or as a result of learning about the unexpected death, injury, or harm of a family member or close friend (American Psychiatric Association, 2000). Symptoms of PTSD include re-experiencing of the traumatic event (e.g., intrusive memories, nightmares, flashbacks), avoidance of reminders of the traumatic event (e.g., inability to remember aspects of the event, conscious efforts to avoid thinking about it), and increased arousal (e.g., difficulty sleeping, hypervigilance, exaggerated startle response) (American Psychiatric Association, 2000). PTSD can occur in those who have experienced natural disasters or human-made disasters (American Psychiatric Association, 2000; Baum & Fleming, 1993;). The lifetime prevalence of the disorder is estimated to be about 8% in the U.S.

Anecdotal reports compare symptoms resulting from the problems associated with MTR such as flooding and blasting to the symptoms of PTSD (Biggers, 2011). It may be the case that,

for some, the stressors associated with MTR are acute and severe enough to precipitate this disorder. One West Virginia resident stated that the effects of MTR on community members were very similar to the effects of the "shell shock" he witnessed during his time as a soldier in Vietnam (Biggers, 2011). Numerous residents who have been subjected to flooding report living in fear of another flood each time it rains (Gunnoe, 2009; Hufford, 2009; Stockman, 2004). People also fear the possibility of waste impoundments flooding or breaking (Stockman, 2004). Others report the fear and anxiety experienced by their children as they struggle with the possibility of another flood or of a shortened life span for them or their family members; children also experience nightmares about these problems (Blakenship, 2006; Stockman, 2004). Some mothers reportedly even put their children to bed fully clothed in case flooding begins and families need to make a quick escape (Hufford, 2009). Residents experience sleep difficulties because of constant worry about MTR effects (Stockman, 2004). Some report fear for their physical safety during blasting, fear that causes them to experience increased heart rate and stomach upset at the sound of each blast (Stockman, 2004). Parents keep their children inside for fear of them suffering injuries from fly-rock (Stockman, 2004). The problems reported by community members suggest PTSD could be a problem for some in the region, especially for those who have experienced significant threat to their own or another's physical safety because of flooding or blasting. It is also reasonable to suspect that other anxiety disorders could be a problem for people exposed to constant health and safety threats.

MTR and Overall Wellness

MTR is likely to affect residents of Central Appalachia in a many aspects of their lives. From ecosystem damage, to physical health problems, to the loss of access to common cultural

practices, to mental health issues, to community disruption, MTR has negative effects on the lives of coal field residents. The evidence for some of these problems is becoming fairly well-established (as in the case of physical wellness), but the research on others is almost non-existent (as in the case of mental health or emotional wellness). Research is needed to more clearly establish the human effects of MTR and other forms of surface mining. Whatever the economic benefits of MTR may be, these benefits could be coming to Central Appalachians at great cost to them in other areas of their lives. In fact, some of the problems with overall wellness that are associated with MTR may be directly connected with the economic system that is in place. In order to capture a more complete picture of the human effects of MTR, one needs to employ a wide lens. The use of the concept of overall wellness or wellbeing is one way to begin to construct an accurate picture of the human effects of MTR.

Wellness is a commonly used term without a commonly used definition. It refers to a state of overall health on a number of different dimensions. The World Health Organization (2006) defined wellness in this way:

> Wellness is the optimal state of health of individuals and groups. There are 2 focal concerns: the realization of the fullest potential of an individual physically, psychologically, socially, spiritually, and economically, and the fulfillment of one's role expectations in the family, community, place of worship, workplace and other settings. (p.4)

Basically, wellness expands the traditional view of good health as physical health and allows us to take into consideration the various aspects of life that contribute to the overall health of people

and communities. The current study used a wellness approach to examine the impacts of surface mining in the hopes that a holistic picture of the human effects could begin to be illuminated.

Conclusion and Research Questions

Despite the wealth of natural resources in the mountains of Central Appalachia, economic problems continue to plague the region. The economic dominance of coal mining has led to social and economic injustices. Mountaintop removal coal mining, a process that is inexpensive and efficient for the coal industry has created a number of serious problems for residents. The literature review revealed that mountaintop removal coal mining has many negative effects on the environment and on the physical health of those in Central Appalachia who live close to it. Anecdotal reports from residents suggest the possibility of a wide range of other negative effects of MTR on community and individual wellness. There has been virtually no empirical research regarding the mental health effects of MTR, although existing evidence suggests that associated mental health problems could be significant. The current study was intended to begin to illuminate how MTR affects the mental health and overall wellness of people in Central Appalachian communities directly impacted by it. My research questions were as follows:

1. What effect does living in communities directly impacted by MTR have on the overall wellness of residents?
2. Do those for and those against MTR perceive the wellness effects of MTR differently?

CHAPTER 3

METHODOLOGY

Although research studies that document the harmful effects of mountaintop removal coal mining on the physical health of residents of coal field communities are being published, little research has been conducted to determine the existence and nature of overall wellness or mental health (Ahern et al., 2011; Hendryx, Wolfe, Luo, & Webb, 2011). However, research undertaken on the effects of living near open pit mining operations in Australia and on the effects of living in close proximity to other polluting industrial activities suggest that such environmental problems do have negative effects on wellness (Albrecht, 2006; Baum & Fleming, 1993; Downey & Van Willigen, 2005). In addition, reports of those living near MTR sites suggest that decreases in overall wellness and the existence of mental health problems for those living in MTR communities are likely (Gunnoe, 2009; Stockman, 2004). Research is needed so that the implications of MTR on residents' overall wellbeing and functioning can begin to be determined and addressed. This chapter outlines and justifies the qualitative research approach that I took, explains how I identified and recruited participants, and describes the interview guide and other forms that were utilized. Finally, I explain the method of data analysis used.

Design Rationale

Because little research has been done on the topic to date, I employed grounded theory methodology (Fassinger, 2005; Strauss & Corbin, 1998). This approach uses data to develop theory that explains a process or phenomenon and helps supply a framework for future research (Creswell, 2007; Patton, 2002). The theory generated in grounded theory research is inductive; it is grounded in data collected from individuals who have experienced the phenomenon under

investigation (Creswell, 2007; Patton, 2002; Strauss & Corbin, 1998). Although grounded theory data can be either qualitative or quantitative, the method has been used far more extensively in qualitative research (Patton, 2002). Qualitative methods tend to be especially useful for accessing people's lived experience (Polkinghorne, 2005). Interviewing is one of the most widely used and important methods of data collection in qualitative research (Fassinger, 2005; Suzuki, Ahluwalia, Arora, & Mattis, 2007). Interviewing allows the researcher to learn about participants' experiences from their own perspectives (Patton, 2002). Data was collected for this study through focus group interviews.

Focus Groups

A focus group is a group of people, typically composed of five to ten participants, who are similar to each other in some important way relating to the topic of the group discussion (Krueger & Casey, 2009). The group members focus collectively on a topic chosen by the researcher (Morgan, 1996; Wilkenson, 1999). The researcher leading the group works to create a permissive environment that allows participants to share their perceptions and points of view without the pressure to reach consensus (Krueger & Casey, 2009).

I conducted two focus groups in each locale: one with community members who expressed basically pro-MTR sentiments and one with community members who expressed mostly anti-MTR sentiments. This approach was selected to help to reduce power differentials, increase comfort for group members, reduce conflict, capture unique perspectives from community members on each side of the issue, and allow for comparison of data between the two groups (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2006; Krueger & Casey, 2009; Morgan, 1996). There were two primary reasons for the need to reduce the likelihood of

conflict in the group discussions. First, conflict is already a problem in many MTR communities. Research that could heighten this conflict and leave more community discord in its wake would be unethical (American Psychological Association, 2010). Second, because in many cases community members have already separated themselves into groups when it comes to opinions about surface mining, conducting a focus group with both those who support and those who oppose the process would not be effective. Group members are not likely to feel safe and comfortable expressing their opinions in such a group (Krueger & Casey, 2009).

I chose focus groups for this project because they offer some particular advantages when conducting research with marginalized groups. The groups help to shift the balance of power away from the researcher and onto the participants, thus helping the researcher to avoid exploiting participants (Wilkenson, 1999). Although the interviewer selects the questions for the focus groups, the group members exercise a good amount of control over their interactions with each other and over the direction in which they take the questions (Morgan, 1996).

In addition, focus groups can help the researcher to avoid de-contextualizing participants; data was gathered with groups of culturally similar people in a setting familiar to them rather than with individual participants outside of their own communities (Suzuki et al., 2007; Wilkenson, 1999). Participants are largely free to relate to each other more like they typically would, thus cultural norms and values are highlighted in participants' responses (Kitzenger, 1995). This is especially important in research with individuals who come from cultures that emphasize community interdependence (Jones, 1994; Salyers & Ritchie, 2006). This interactional process of focus groups generates data and ideas that would be less accessible in individual interviews (Suzuki et al., 2007; Wilkenson, 1999).

Another advantage of focus groups is that they allow for information to be gathered from several participants at once, thus making sampling across states and finishing the project within the expected timeline possible (Suzuki et al., 2007). Although gathering data from participants in three different states was complicated and time consuming, sampling from several areas of Central Appalachia that have been affected by MTR provided a more representative picture of the effects of the process on wellness.

Each group consisted of at least four but no more than eight members. This number was small enough to allow for active participation from each group member and large enough to allow the observation of group dynamics (Krueger & Casey, 2009). All but one group had at least five members. In addition, smaller groups are thought to work better with topics that are emotionally charged because as long as the participants feel it is safe to participate openly, these topics tend to produce a lot of participant involvement. Most group members actively participated in each group, and only one group member (in the largest group) did not speak at all.

Participants

I identified participants through purposeful sampling methods. Unlike the random sampling used in quantitative research in which the goal is to gather a large, representative sample of the population under investigation, qualitative research utilizes purposive sampling methods (Patton, 2002; Polkinghorne, 2005). In purposeful sampling, relatively small "information rich" samples are gathered for the purpose of in-depth analysis (Patton, 2002). Participants are specifically chosen for what they can teach the researcher. In most focus group research, the sampling strategy used is homogeneous sampling (Patton, 2002). In this form of sampling, participants with similar backgrounds and experiences are brought together to discuss

major issues that affect them (Patton, 2002). This was the method I employed in this study. In order to gather a homogeneous group of participants, I also utilized snowball sampling. Snowball sampling identifies one information rich participant who can then identify other information rich participants and so on until enough participants are identified for the focus group (Patton, 2002).

For the current study, I identified one information rich pro-MTR participant or one anti-MTR participant from each area. I then asked these participants to identify other possible participants, from their own "side" of this issue. Initial participants were recruited primarily through the help of university professors. Dr. Theresa Burriss, Radford University professor and Director of the Appalachian Studies Center at the university, was able to provide connections with two contacts in far Southwest Virginia, one who was pro-surface mining and helped recruit participants for that group and one who was opposed to surface mining and helped recruit participants for the anti-surface mining group. Key contacts recruited participants through phones calls, e-mail, and word of mouth. Dr. Theresa Burriss also provided several contacts in Eastern Kentucky, mostly at colleges and universities in that region. Through these university contacts, a community member with connections to people on both sides of the issue through his business was identified. This individual volunteered to recruit participants for both groups in Eastern Kentucky. In West Virginia, a Berea College colleague who had once worked on water issues in surface mining communities in the area was able to connect me with a resident on each "side" of the issue willing to recruit participants. Each of those residents who volunteered to recruit participants was provided with a summary of the research project and with a summary of what participation would involve. Wording of the summary was changed slightly depending on the type of group for which the volunteer was recruiting (See Appendix). I then worked with

each volunteer to arrange for a place to meet with participants and for a date that would work well for participants. Each key contact also participated in a focus group.

Most qualitative research strives for saturation and typically does not specify a pre-determined number of participants. Saturation occurs when the research has reached the point at which new information is no longer being revealed (Krueger & Casey, 2009; Patton, 2002). The typical number of focus groups planned for a study is 3-4 (Krueger & Casey, 2009). If saturation is not reached at this point, more focus groups are usually conducted. Because of the time and resource constraints of this study, three focus groups with participants who oppose MTR and three with those who support MTR were pre-determined to be the maximum number of focus groups conducted.

I recruited participants from three different areas: Eastern Kentucky, Southwestern Virginia, and Southern West Virginia because these states are the most heavily surface mined states in Central Appalachia. There were a total of 32 participants. There was an almost equal number of participants in the pro and anti-surface mining groups and an almost equivalent number of male and female participants. Fifteen participants were female (47%) and 17 participants were male (53%). In the pro-surface mining groups, there were a total of 17 participants (10 male and 7 female). In the anti-surface mining groups, there were a total of 15 participants (8 female and 7 male). The majority of participants identified as White (91%). One participant identified as White/Native American, one as White/Hispanic, and one as Hispanic. All "non-White" participants were members of anti-surface mining focus groups. The majority of participants also indicated that they had lived in the region for most of their lives (range 10-83 years; average 43 years). Also, most indicated that their families had lived in the region for

generations with only one participant indicating that she had no biological family from the region. Many participants were able to identify the approximate dates of their family's arrival in the region centuries earlier (e.g., "since 1853," "since the late 1700's"). Seven of the 15 participants in the anti-MTR group (47%) and 10 of the 17 participants in the Pro-MTR group (59%) indicated that they had worked in the coal industry. All 17 participants in the pro-surface mining groups indicated that they had close family members who work or had worked in the coal industry, and 14 of the 15 participants in the anti-surface mining groups endorsed this.

Participants were asked to rate their opinion of surface mining on a five point scale with 1 indicating "I strongly support surface mining," 5 indicating "I strongly oppose surface mining," and "3" indicating "I am neutral about surface mining." Fourteen of the 15 participants in the anti-MTR groups circled the 5 indicating that they "strongly oppose surface mining," and one participant circled the 4. The responses to this scale made by those in the pro-surface mining groups was more varied. Seven of the 17 of pro-surface mining group members circled the 1 indicating strong support of surface mining (41 %), four of the 17 circled the 2 (24%), four of the 17 circled the 3 (24%), and two circled the 4 (12%). The varied responses among the pro-surface mining group members suggest a greater amount of ambivalence in these groups than in the anti-surface mining groups. However, all participants in the pro-surface mining groups self-identified as pro-surface mining when agreeing to participate in the focus groups. Importantly, opinions were least varied and most strongly supported surface mining in the pro-surface mining Southwest Virginia group (all participants circled 1 or 2). Alternately, they were most varied in the WV group in which two participants circled 4 and no participants circled 1 indicating a good deal of ambivalence about surface mining. Reasons for the variation within the pro-surface

mining groups are explored further in the Discussion section.

Instruments

Semi-Structured Interview Guide

When talking with members of MTR communities as I was planning the current study, it became clear that the problem with stigma surrounding mental illness in the area had the potential to be a barrier to the recruitment of participants. In West Virginia, for example, I was turned down by several possible key informants who believed that the project was useful but who were uncomfortable asking people they knew to talk about mental health issues. I also consulted with two graduate students who grew up in MTR communities and have many family members who work in the coal industry, both in surface and underground mines. These students also believed that people in the coal fields would be uncomfortable talking about "mental illness" or "mental health." In the attempt to overcome this stigma, and in keeping with counseling psychology's traditional focus on a holistic view of mental health, I decided to use a wellness approach to the focus group interviews. Therefore, the interview guide consisted of a wellness wheel (University of Miami, 2009) and a prompt reading: "Overall health or wellness is influenced by many factors. Please talk about how living near surface mining affects people in each of the areas listed on the wheel below."

Each participant was given a sheet of paper with the image of a multi-colored wellness wheel under this prompt (Appendix A). This gave participants a visual guide during the discussion and the researchers a way to help keep the group on track. The participants also were instructed to use the back of the sheet of paper to write down any comments that they wanted to share but might not want to share with the whole group. This allowed participants who were

uncomfortable sharing highly emotional material with the group to share this information anonymously. Very few participants chose to write on the wellness wheel handout and all of what was written down was also mentioned aloud. Those who record written comments added these to the front of the sheet, often writing comments within the wheel on whatever colored section was relevant to their statements. Because the written information did not add anything new to what was mentioned aloud in the focus groups, this written data was not included in data analysis.

Other cultural concerns were taken into consideration in the creation of the interview guide. First, the terminology used to describe mountaintop removal coal mining varies among groups of people. The coal industry now typically refers to the process as "mountaintop mining" (West Virginia Coal Association, 2010). Mountaintop removal coal mining, the term formerly used by the coal industry, still tends to be used by people who oppose the process. As reported by residents of MTR communities with whom I spoke, many people may simply still call MTR "strip mining" as this is what most surface mining has been called in the region for decades. Finally, there is the more generic term "surface mining," which refers to several different processes of mining of which MTR is one of the most common forms currently. For the purpose of data collection, I used the term "surface mining" most frequently, especially in introducing the topic, as this term seems to be the most neutral and generic. As the focus groups progressed, I mirrored the participants in the terminology they used to describe MTR.

Demographic Information Form

Participants were asked to answer a few simple demographic questions before the focus groups began (Appendix B). The demographic form asked the participant's sex, coal industry

employment status (whether they were employed in the coal industry), family members' coal industry employment status, if they were from the area, and the number of years they and their family had lived in the community. I asked participants to identify their sex because previous research on industrial pollution has revealed some gender differences in the ways people perceive and are affected by pollution (Boardman, 2008). I asked them to identify their connection with the coal industry for two reasons. First, it was likely that a large majority of participants in both groups would have some association with the coal industry because it is a dominant employer in the region. Second, those who are employed by the surface mining industry or have close family members who are employed in MTR may view stressors and mental health effects associated with MTR differently than those who do not have the same connection with MTR. I considered all participants who currently live in the sample communities to be community members. However, the number of years that someone had lived in a community and the number of years they have had family members living in the area may have had a significant impact on the ways in which MTR activities affect their mental health.

Informed Consent Form

An informed consent form was reviewed with all participants before their final agreement to participate in the study (Appendix C). In order to maximize participant comfort in sharing information and to further safe guard confidentiality, the participants were not asked to sign the consent form but only to give their oral consent to participate. Participants were encouraged to leave the room if they did not agree with the informed consent form. No participants chose to do so.

Researcher as Instrument

In qualitative research, the interaction between the researcher and the participants is an important part of the process because the researcher is considered an instrument of the research (Kleinman, 2007; Yeh & Inman, 2007). Interactions between the researcher and the research participants influence both the research process and the data that are obtained (Patton, 2002; Yeh & Inman, 2007). It is crucial, therefore, for the researcher to attend to the culture and context of research participants, both for the purpose of building rapport and for the purpose of accurate understanding of participants' experiences (Morrow, 2005).

Further, it also is important for the researcher to make her social position in relationship to the subjects of research explicit, exposing implicit assumptions and biases, so that others can determine how her worldview may have affected research results or interpretation (Morrow, 2007; Ponterotto & Grieger, 2007). Thus, I now describe aspects of my personal background that are relevant to the proposed research. I am a White female in my early 30's. I grew up in rural West Virginia, just outside of a town known for its logging history. My father was a small business owner in that town for a number of years and is also a pastor of a conservative Protestant church. Underground mining was practiced in the area where I grew up, and I knew miners from my church and school communities, but I was not aware of the practice of surface mining until I left the area to attend college.

I attended Berea College in Kentucky, where I studied psychology and women's studies. Berea College is an institution well-known for its social justice commitments in the Appalachian region, and it was at Berea that I learned about mountaintop removal coal mining and its effects on the land and people. It was also during my time at Berea that I began my study of feminist theory and began to call myself a feminist. I am currently a student in Radford University's

counseling psychology doctoral program, which has emphases in social justice, diversity, rural practice, and evidence-based practice.

I participate in anti-mountaintop removal activism and believe that coal mining and the monoeconomic system surrounding it has had many negative effects on the region. Although I grew up immersed in Appalachian culture and still value and practice many aspects of that culture, I also tend to be more religiously and politically liberal than many in the region. My family members have often worked in industries that support the coal mining industry (e.g., carpentry in company towns, drilling for coal seams), but only a few of my family members have worked in the mines and only one of them has worked on surface mines. I have never lived in a community directly impacted by surface mining. Although I do believe that MTR is harmful both for the environment and for the people of Central Appalachia, I also believe that the people directly impacted by the process are in the best position to understand how it affects them. My opinions about MTR are strong, but so is my respect for the people of the region, as I believe that we have many cultural strengths that are often overlooked and discredited. I also know that it was essential for me to monitor and compartmentalize my own opinions about the issue in order for me to accurately understand the perspectives of my research participants. I trust the scientific method to provide the most accurate information and understand that my research will only be taken seriously if I was able to capture the experiences of my participants in the most objective way possible and not in a way that is overly influenced by my own background, opinions, or beliefs. As a therapist-in-training, I have learned how to listen to others well, express the empathy that I feel for them, and help others feel safe and comfortable in sharing their thoughts and feelings. These skills aided me in this research as well, especially because we were talking

about sensitive and controversial issues.

Procedure

Before beginning data collection, I obtained approval from the Radford University Institutional Review Board. Focus groups were conducted in January, March, May, and June of 2012. Both focus groups in Kentucky were conducted on the same day in nearby communities. This was also the case in Virginia. Two trips to West Virginia had to be made, however, to accommodate participants' busy schedules.

At the outset of each group, participants completed the informed consent process (Appendix C) and the demographic forms before each focus group discussion began (Krueger & Casey, 2009). To avoid discrimination against participants with lower literacy levels, I (or a research assistant) explained the informed consent orally to all participants after giving participants adequate time to read the document. In addition, I answered any questions about the demographic form that participants had.

For each focus group, a research assistant accompanied me to help with the informed consent process, the demographic questions, and with moderating the group process (Krueger & Casey, 2009). In the focus group literature, the researcher is typically referred to as the moderator and the term encompasses the many roles that the researcher plays including recruiting participants, interviewing, and analyzing the data (Greenbaum, 2000; Krueger & Casey, 2009). The term "moderating" as used here refers specifically to the facilitation of the group discussion. Research assistants helped me to make sure that the process of the group discussion provided the best possible data (Greenbaum, 2000). The research assistant helped me to keep track of the time, prompted the group to move on to another topic if necessary in order to

make sure all topics on the wellness wheel were covered with each group, and encouraged hesitant group members to talk by asking them questions about their experiences.

Because of scheduling and availability issues, a different assistant accompanied me to the groups in each state. Dr. Ruth Riding-Malon assisted with the groups in Virginia, Jenni Stroup with the groups in Kentucky, and Zetta Nicely with the groups in West Virginia. Dr. Riding-Malon is a Radford University psychology professor and Zetta Nicely and Jenni Stroup were both graduate students in the Radford University doctor of counseling psychology at the time of this research. Each research assistant helped with handing out, explaining, and collecting demographic forms, and handing out and explaining consent forms. The research assistants also were responsible for completing the informed consent process with any participants who arrived late for a group. No significant qualitative differences were noted in the groups as a result of the participation of different research assistants; they all seemed to play similar supportive roles. All three research assistants have had training and experience with qualitative research and have expertise in mental health, group processes, and rural culture.

Focus group interviews lasted an average of an hour and a half, typically with an additional half an hour included to complete demographic forms and explain informed consent. In the Southwest Virginia anti-surface mining group, two of the participants wished to continue the discussion of the topic after the official group had ended and the three other participants had left. Information included from this extended interview is indicated in the text by an asterisk that follows the notation of the state (VA*). Focus group interviews were audio recorded to allow for transcription and analysis of the interview data. For each group, two audio recorders were used. This was done to provide backup in case either of the machines malfunctioned and to capture

audio in different areas of rooms that were not especially well-suited for audio recording.

Each participant was compensated for sharing his or her time and knowledge at the end of the focus group with a $20 gift card to Wal-Mart. I choose Wal-Mart gift cards because most people have access to a Wal-Mart store relatively close to their community, even in rural areas.

Focus Group Settings. Focus groups were conducted in a variety of settings depending on the area and the access each key informant had to meeting places. Settings included conference rooms in two office buildings (in each case the business was closed), two community buildings that were either rented for the afternoon or used free of charge, the garage of a private residence, and a small restaurant in the back room of a convenience store. The use of the back room of the convenience store was the most complicated in terms of privacy for the participants and ease of audio recording. The room, alongside the kitchen, was very small. One plastic patio table with five plastic chairs was set up. Others sat or stood around the table along the walls or shelves. Because the room was hot and there was no air conditioning and no windows, several box fans were running. This made it difficult to hear quieter participants and to get a clear audio recording of the group but the fans also provided a measure of protection making the group conversation harder to hear by other customers in the store. Aside from two women coming back to the kitchen to cook, only one customer entered the room during the interview. This man was a surface miner and he asked what was happening and made a few comments about surface mining. Participants seemed to soften their comments about the negative impacts of surface mining when this man was in the room and to emphasize its necessity, but they made several comments after he left disagreeing with his completely positive comments about surface mining. The presence of this miner was a limitation that is discussed below. All other groups were

conducted without interruptions from other community members. In each of the other groups, participants were seated in a circle around a table and effective audio recording was much easier.

Analysis

The data analysis method used in grounded theory is called coding. Coding is typically completed in three stages: open coding, axial coding, and selective coding (Creswell, 2007; Fassinger, 2005; Strauss & Corbin, 1998). As coding is undertaken, the constant comparison method is used, as data is compared across participants, categories, and concepts. These components are compared to each other and to new data, and variations of the categories are explored (Fassinger, 2005). In open coding, the data are coded for major concepts and these concepts are labeled. Then, the concepts are examined for alternative meanings (Creswell, 2007; Fassinger, 2005; Patton, 2002; Strauss & Corbin, 1998). In addition, the researcher begins to group concepts into categories during open coding (Fassinger, 2005). After the focus groups were transcribed, I began this process of open coding. Data were coded line-by-line for initial categories. As open coding progressed, it became more and more clear which categories or themes were repeated across participants and groups. After completing open coding, my academic advisor Dr. Ruth Riding-Malon served as an auditor, reading over the transcripts and categories and offering input as to the fit of the data to the proposed categories. After we had settled on a basic categorical scheme that seemed adequate to both of us, I moved to axial coding.

In axial coding, the relationships among categories began to be uncovered and subcategories were created and placed under the umbrella of key categories (Fassinger, 2005; Strauss & Corbin, 1998). The key categories that emerged from the data generally mirrored the

sections of the wellness wheel used for the interview guide (see Appendix A). This means that the wellness wheel shaped the themes. While the wellness wheel helped the data collected to be more comprehensive than it might have been otherwise and provided some useful structure to the focus group process, it did influence the way that the participants talked about wellness and surface mining. If participants had been asked about wellness in a more general way, their responses may have been different and they may not have spoken about all of these themes.

Sub-themes that emerged from the data were organized under the key categories as they best fit into the organizational scheme. At this point in the coding process, the categorical scheme was again audited, this time by another committee member, Dr. James L. Werth, Jr. Dr. Werth offered feedback about category names that seemed to be too broad, sections of data that did not seem to be well enough accounted for, and sections of data that seemed to be misplaced or better represented by different categories. At this point in the coding process, a few categories that had under five supporting quotes or only a few quotes all from one focus groups were eliminated as these categories did not seem to be representative enough to be qualified as themes. After the coding scheme was again revised, it was shared with Dr. Ruth Riding-Malon for another round of auditing. After incorporating her feedback, a final coding scheme was settled upon.

Typically, the final step in grounded theory is selective coding. In this step, core categories that incorporate all of the other categories into an explanatory whole are determined (Fassinger, 2005; Strauss & Corbin, 1998). A summative narrative or theory is then created that captures the most important aspects of the data (Fassinger, 2005). As the theory is emerging, the constant comparison method mentioned above is used to ensure that the theory is true to the lived

experience of the participants (Fassinger, 2005). Due to the limited number of participants, the lack of the voices of important community constituents such as actively working coal miners, and due to the substantially divergent opinion of the pro-surface mining Virginia group, a comprehensive theory was not developed from the data collected for this study. However, the results of this study could be used in combination with the results of similar future studies to help form such a theory.

Trustworthiness

The researcher needs to maintain an awareness of potential bias in the way she views the research to avoid misrepresenting the data that are gathered. One suggested way to do this is through journaling (Patton, 2002). After each focus group, or set of focus groups when they occurred on the same day, I took some time to reflect on the experiences that I had, and to write down my reactions to these experiences and any biases or assumptions that I became aware of as I collected data (Morrow, 2005). Through this process, I was able to prepare myself for the next focus group I would conduct, working to clear my mind of biases and pre-conceived notions about how the groups would respond to me and to the topic at hand.

In order to maximize the trustworthiness of the research, I also consulted with my advisor, committee members, and research assistants during the process of data collection and analysis (Morrow, 2005). I found conversations following each focus group with my research assistant to be especially useful. As I had three different assistants, all with different backgrounds and ideas about surface mining, I was able to hear a variety of perspectives about the focus groups and the issues discussed.

I also incorporated the practice of auditing into the data analysis process (see the coding

section above for details). I had two different auditors review my work at different stages of the analysis process. Both auditors have experience with qualitative research and data analysis and were able to provide helpful feedback that prevented me from becoming myopic in the analysis process.

Participant Feedback. Ideally, member checks are used, and this process allows participants to give feedback to the researcher as to how accurately their ideas and experience is captured by the researcher. As a result of time constraints, I was not able to share the entire document with participants. Because I did not collect contact information for participants, I sent an electronic copy of the Methods and Results sections to key informants and asked them to share the document with the participants they recruited as was possible. In addition, I offered to share hard copies of the document with any who could not easily access the electronic copy. This allowed participants the chance to provide feedback about the way the process of the research was documented and about the way the results were written. This was an important aspect of ensuring trustworthiness and an important step to take when working with this sensitive topic (Morrow, 2005). I asked participants to share feedback by January 3, 2013in order for their comments to be included in the final dissertation document but stated that I was also open to receiving their responses after this date. To date, I have received feedback from two anti-surface mining participants. The content of this feedback is included in the Discussion Chapter.

CHAPTER 4

RESULTS

In this chapter, I outline the results of the research. Data analysis produced seven themes and 29 sub-themes. The themes that emerged generally followed the sections of the wellness wheel used in the interview guide (University of Miami, 2009). It can therefore be said that the themes arose as a result of the questions asked and were not general ideas that emerged across the course of each focus group. The seven themes are: Economic/Occupational Wellness, Environmental Wellness, Emotional Wellness, Physical Wellness, Cultural Wellness, Social/Community Wellness, and Intellectual Wellness. Although participants also talked about aspects of Spiritual Wellness, the eighth section of the wellness wheel on the interview guide, the comments about spiritual wellness were not consistent enough to form any subthemes. Each of these overarching themes is broken down into its subthemes and described in the sections below. Sub-themes were included if they were mentioned by at least five different participants and across at least three groups (15.6%).

Some themes were given greater attention than others by the focus group members. Themes are organized hierarchically in the chapter so that the themes that were given the most attention by participants are described first and the themes that were given the least attention are described last. Specifically, themes are organized by the number of quotes in each theme. A summary of each theme is given at the beginning of each section before the sub-themes are described. Sub-themes are also organized in a hierarchical fashion by number of quotes, number of groups that mentioned the sub-theme, and number of participants that mentioned the sub-

theme. These numbers are noted by the heading of each sub-theme. Sub-themes that were mentioned by only pro-surface mining participants or only anti-surface mining participants are included at the end of each themed section. Differences and similarities between pro-surface mining and anti-surface mining groups are highlighted. Illustrative quotes are provided under each sub-theme to highlight the voices of the participants and clarify the concepts. Section headers are organized by theme and sub-theme. See Table 1 for a complete list of themes and related subthemes.

Environmental Wellness

Environmental issues were mentioned frequently across the groups. Anti-surface mining groups talked about these issues most frequently, but both types of groups spent a good deal of time discussing environmental issues. Those in the pro-surface mining Virginia group had very few complaints about environmental problems associated with surface mining and generally argued that surface mining has led to some environmental improvements in their region.

Water Pollution/Water Loss (73 quotes, 6 groups, 20 participants)

Problems with water were the most heavily focused upon aspect of environmental wellness. Those in the pro-surface mining groups expressed mixed opinions on the issue. Some claimed that the water in the area is cleaner than ever. This positive view was mostly held by pro-surface mining participants in Virginia: “Water now is probably cleaner than it was 20 year ago. I guarantee it.” Typically, those in this group credited the coal industry with improving water quality by providing revenue to build infrastructure. Several participants in the pro-surface mining Virginia group associated historical problems with water pollution on the poor sanitary

habits of community residents often related to problems with infrastructure and credited coal companies with improving water quality:

> There's probably some of what we call straight pipe systems still…but at one time there was hundreds. And we've cleaned up all of those. There was a program over a period of a few years there and…they just went in…and everybody got a septic system and now we've went a step farther, most of the people in the county have a sewer available to them.

Participants in this group cited some problems with water because of coal mining activities, however. For example, this participant talked about the leakage of coal waste water: "Oh, no. It ain't treated, it's not treated at all. See the mining companies are out of there now, so that's just the natural order of things. It's running down over into the [creek].

Those in the pro-surface mining groups in Kentucky and West Virginia were less positive about the effects of the coal industry on water quality. One pro-surface mining participant from Kentucky stated: "If you live in a close environment with the stripping, your water that you drink is probably about the first thing that they mess up." A participant from the West Virginia group talked about the effects of the mining on the water near his home:

> They pump [the waste water] out of the plant, pump it through a pipe, and they've drilled wells all over these mountains. They dump it down those wells in the old coal mines. There's been a town or two down in Southern West Virginia that have lost their drinking water because they drilled wells down into their fresh water and was pumping water out of the ground. So they would do it real good until this slurry come in and contaminated their water. And they no longer could drink the water, no longer could do this and that.

> Now, behind my house they've done that. And if it rains and the mud holes sit for a day or two, you can see the oil sheen on top of the water. And it's the slurry that's doing that. That means that the ground water's not drinkable. You can't do much of nothing else with it either. It's totally gone. It's wiped out. And I figure it won't be much longer and all of the fish will be gone. And everything else unless they do something about it.

These participants also mentioned the refusal of the coal company to help when water was polluted: "It destroys your water and you try to get them to fix it and they will not" (KY).

Those in the anti-surface mining groups had a lot to say about water pollution through surface mining as well. One participant from Virginia described the effects on the water this way:

> Whatever's on that highway and whatever's coming off those trucks when they get to our highway…all those harmful metals and other stuff that's mixed up in that blasted up area, once it's tracked onto the highway and once it's deposited there as mud and once it's washed off…it all goes into our streams. And our stream below my house right now, it's filled up with silt and dead. A few years back, I had the EPA come down and check it and they said there was no life in it…They used to baptize people in this one stream up there and in this one pond and that stream right now is nothing but a filled up weed pile.

Another participant from Kentucky talked about the effects of surface mining on the family's wells: "We had well water, drilled wells, and we lost a well from the blasting, it broke up the casing." This participant had the family's water tested and reports that it had: "130 times the recommended levels of arsenic in it. That's what [my daughter] bathed in for the first 3 years of her life." This participant also went on to describe the family's ongoing expense and

continued battle with water filters and bottled water to try to ensure that they are using safe water. In West Virginia, similar problems with water were described. One participant talked both about the problems with well loss and polluted water her family experienced and about her struggles in getting the problems fixed by the coal company:

> And they come and replaced a few of the wells and as soon as a couple more shots let off, those wells went dry, and they done it again. And my mother was getting pretty sick and had the water tested, and it just wasn't fit for human consumption. Nobody's was up that hollow. So [the company] started bringing in just these great big old plastic things full of water that they put in people's yards for them to get water out of. I went up to visit one day, you could just see the bugs and squigglies and stuff inside the water and I said, "Mom, you can't be drinking that water." So, I called them and they said, "Oh, we'll come and fix that." So they sent a man out with gallon jugs of Clorox, poured it right in that thing and said it was good. I said, "No, I said that's not right." So I went ahead and took a sample of that water myself, and I sent it off. It come back, and it wasn't even fit to wash your hands in or anything.

Water pollution and well loss was a major concern for many participants, especially those in the anti-surface mining groups. Participants also reported that water pollution has implications for health. These will be covered in the physical wellness section.

Surface Mining Regulations are Followed/Not Followed (66 quotes, 6 groups, 21 participants)

One topic that was given a good deal of attention in both pro and anti-surface mining groups was that of surface mining regulations. There was also a great deal of divergence in

opinions about the extent to which mining regulations are followed, both between group type and within group type. Some were very confident that surface mining is done according to legal standards. For example, pro-surface mining Virginia participants stated the following: "When they blast, they always sound off." "And a lot of the trucks now, they're putting in where they roll the trucks through and the trucks get washed off before they leave the job to keep the dust down." "They got a regular street sweeper, it goes from the strip job over above me to the [next] strip job. It goes over and back 3 or 4 times a day just cleaning." "All your drills have water on them now." "Alpha's very, very focused on running right." "Boy, it's amazing in what, the last 20 years, how much stripping has changed." Those in the pro-surface mining Kentucky group expressed some similar view points: "One thing they do when they haul coal out of there, they definitely start watering that road." But this group along with the pro-surface West Virginia group seemed less confident that the coal companies follow regulations than the Virginia group seemed. "They do some things by the book like they're supposed to and then some things they don't."(Pro-KY)

One Kentucky pro-surface group member who lives just below a surface mine stated: "They're only supposed to let off one [blast]…yes, one a day about 3 or 3:30. They totally lie is all I can say….They do it about two or three times a day. I'm there. I know." Another Pro Kentucky participant stated:

> A lot of surface mines, they cut more corners than what they do underground…you have more problems with slides and rocks, and they're destroying your water and all that. And there's ways they could keep from it…it's good that we got coal, but it would be even better if they did it right. It would save lives.

In the West Virginia pro-surface mining group, participants expressed the following concerns about "slurry." Slurry is a liquid waste product created from the coal cleaning process.

> I know we found a place where they was pumping slurry, plumb to the top of the hill then pumping it down to fill the mountain up is what they was doing….they put a security guard up there after they found out we was up there looking at it. They put a security guard in so we couldn't go up there and look at it again. Just black, oily, sooty.

In the anti-surface mining groups, there were many complaints of regulations being broken by the mining companies. Anti-surface mining group members from both Virginia and Kentucky talked about surface mining operations or practices that were not permitted at all happening near their homes: "They sneaked in there. They didn't even have their permits…They stripped for over a year up back in there and didn't even have a permit to do it. They sure did." (VA) "But yeah, they do illegal stuff. They did 2 illegal valley fills" (KY). Others in the anti-surface mining groups describe specific regulations violated on the mines near their homes:

> They wouldn't even cover them trucks. They was supposed to have a…curtain, this thing that goes down over it. And they would have it way up past that, and it falling all over the road in front of the house (VA).

> When they first started stripping and augering up in there, it started up above my house…If they wanted to put a shot off at 11:00 at night or whenever they wanted, they would do it. That's illegal as it could be. It's supposed to be from sunrise to sunset (KY).

Some participants talked about coal companies committing many violations near their homes: "Anyway, with her health, we started a little project to see how many violations this one coal

company has committed. There's over a hundred violations, and we've got them right here" (VA).

Anti-surface mining participants also complained about laws and regulations not being enforced and fines for violations that are given but not being collected:

> And the next thing I asked I said, 'are these violations being paid? Are they paying for these violations?' You won't get an answer there. They told me that they was in the, reviewing them, they were being appealed, they're not being paid (VA).

The pro and anti-surface mining groups differed to some degree on the extent to which they believed that the coal companies were following mining regulations. However, all groups except the pro-surface mining Virginia group voiced concerns over illegal behaviors of surface mining companies that they believe put local residents in danger. Interestingly, several pro surface mining group members saw some of the surface mining regulations that were followed as detrimental to further economic development:

> You can't run two to 250 of coal a day if you have to do it right. You can maintain your dust in there but you can't go in here and cut, if you've got to cut 20 foot and stop and worry about what state or federal is wanting you to do. It's unreal the way it is (KY).

Environmental Devastation and Loss of Beauty (39 quotes, 5 groups, 16 participants)

Some group members from both sides of the issue talked about the devastating effects that surface mining has had on the overall environment. Those in the pro-surface mining Virginia group saw the environmentally damaging effects of surface mining primarily as a thing of the past: "But the thing that we did when we were pushing it over the hill, now that was a scourge.

We did well to quit that, because that just made a wreck of things." They also asserted that environmentally negative effects of surface mining are more of a problem in other states:

> And you could take all of Southwest Virginia and put it in one place in West Virginia and it wouldn't be—like this table top, [Southwest Virginia] would be like your thumb….West Virginia is one of the, they've done more surface mining than probably any other state in this area.

But members of this and other pro-surface mining groups did talk about some of the environmental problems with surface mining. One pro-surface mining participant from the Virginia group did say that he thought the land near his home was going to be "a pure gaum" when the mining was finished there. "Gaum" is a traditional Appalachian word used to describe something that is in a mess or in a state of disarray (Montgomery & Hall, 2004). As one Kentucky pro-surface mining participant stated to another: "Well, that's your holler. They're going to tear it all to pieces before they get through with it." A pro-surface mining participant in West Virginia expressed very similar concerns: "That's the only thing that I think is wrong with strip mining is they tear mountains to hell." Pro-surface mining West Virginia participants described the environmental devastation they perceived in the following ways: "You almost feel like you've landed on the moon." "You wouldn't believe what they do to the mountains. Oh, it looks like a cancer." "It's just a big, festering wound." "West Virginia is not going to be West Virginia. It's not now."

Anti-surface mining participants described similar environmental destruction. "Every ounce of everything down through there, they destroyed it all" (VA). Another anti-surface mining participant from Virginia said it this way:

> It's destroying this area, and it's almost the oldest mountain range in the whole world and the most diverse mountain range in this world you know with the rainforest and all that. How can you, how can they justify destroying that? All the organisms. All the life. All the vegetation and the trees and all that. Blasting it.

A participant from West Virginia saw the environmental devastation as reaching beyond the Central Appalachia region: "My people pay with their health, their land, their water, the air they breathe. Not just my people, they whole world is going to end up paying for it."

One of the specific elements of environmental destruction that participants addressed was the loss of natural beauty to surface mining. Participants from both "sides" mentioned the aesthetic changes associated with surface mining. Pro-surface mining participants in Virginia mentioned these changes as being one of the main reasons that some people oppose the practice: "One of the biggest problems with strippin' is it's visual. You can see it. And if you can see it people can fuss about it. And if it's not visual, you'd never heard a thing about it." Some participants in this group argued that aesthetic changes resulting from surface mining could be beautiful and that former surface mines might even be good tourist attractions:

> People spend a fortune going to the Grand Canyon. There's not a whole lot of difference if you start going out west and look at the way the rock formations are and then start looking at all these strips around here that's not been reclaimed.

A participant in the pro-surface mining group in West Virginia did not see the issue in the same way: "So, I mean [the area] still has beauty, but its beauty is being taken too."

Those in the anti-surface mining groups lamented the loss of beauty near their homes as a result of surface mining:

> They…tore up that big mountain. It was a beautiful mountain there. You can look in the pictures and see the mountains in there, you can see. You can look up there are see how horrible it is. It's a big slurry pond there now" (VA).

A participant from Kentucky talked about the changes in beauty near her home after clear cutting for surface mining began:

> Well, when I first moved here, it was real pretty. We had deep mines behind the house but that wasn't....It was really pretty. The trees, I always tell people, the trees were like a tunnel when you'd go along the dirt road it was like a tunnel, like something you'd see in Beauty and the Beast or something. So, it was really pretty. And then they started cutting down all the trees.

Participants talked about the contrast between the areas that are untouched and the areas that have been surface mined: "So, when I go hiking up in the hills, I can look one direction and see just a total chopped off mountain, and I can look the other way and see beautiful hills. So, that kind of thing it's like, it really has an effect on people that's hard to quantify" (KY).

Reclamation Successful/Not Successful (37 quotes, 5 groups, 15 participants)

Those in the pro-surface mining Virginia group argued that reclamation is done and is done well in their area for the most part, although they did express some concerns. Some from this group talked about successful reclamation projects:

> And that strip was done, the far end out there that dad bought was done in the 50's. And it was push and shove. It's a mess. I mean it's not pretty or anything. But there's poplar trees out there that are that big around. And there's pine trees. We planted those in the 70's, I guess, when we stripped that one section, I've got pine trees that big out there.

Others expressed similar opinions:

> And it will build into useful land. There's lots and lots of apple orchards around here. [They] had some land stripped over there, and they started an orchard on it…Three years later [my neighbor] was at a symposium at Virginia Tech, and he had a couple of bushels of really beautiful red and golden apples, and he was passing them out up there…and he said that was grown on a strip job.

These participants also argued that land could be made useful again in a timely manner: "And all of this within a period of 40 or 50 years, which in the grand scheme of things is not very long." Still, some members of this particular group expressed concerns with reclamation efforts:

> Well, we hydro seeded it, we put trees up there and stuff, so we didn't have a lot of actual wash off of that. Still, you can't put a mountain back boys, it still drops…That wall will be back up there. Probably before I die it will drop down another 4 feet.

They also discussed how some aspects of reclamation do take a very long time: "Hardwoods are not like the pines and so forth. They don't come back right away. It takes a long time."

Participants in the Kentucky pro-surface mining group also expressed positive sentiments about the reclamation efforts that occur: "They do reclaim it." "That there's a whole lot. They'll plant trees and clean your streams." However, these participants, along with the pro-surface mining West Virginia participants, also expressed concerns about reclamation:

> When they get done, if they'll reclaim it all, and like you said, plant trees and do all that stuff, it's fine. But you get some of these places they going to go in there and think they can reclaim it in two or three days and make it worse than what it was before they started (KY).

A West Virginian pro-surface mining participant stated: “But they don't put trees back on it. They just cover it up with dirt and rock, you never see the trees come back on it.” Another described how the companies approach reclamation in his opinion: “Cheap as they can” (WV).

Those in the anti-surface mining groups did not share any of the positive opinions about reclamation efforts that were mentioned in the pro-surface mining groups:

> …When we blow [the mountains] up and push all that debris down slope and into the stream beds, then we go back and do what we declare is reclamation, we make these little...that was the approximate original contour. But it was not the approximate of what was there to begin with. Nowhere close” (VA).

An anti-surface mining participant from Kentucky put it this way:

> …There ain't anything that can grow on top of a rock hardly and that's about what it amounts to. They take all of their topsoil, put it in a valley or somewhere or another, then take that rock and push it right over the hill. They have some kinds of little old scrubby bush that they can grow up there, but it'll never be any timber or anything like that anymore.

Some participants described coal companies who never fully reclaim the land or who leave it un-reclaimed for many years even when active mining is not occurring:

> You've got mine permits all over the place that sit open for years, and years, and years and never close. Nobody ever asks why. Nobody says: produce a report. We're going to have a hearing on this. We're going to expose to you. Nobody ever says how many. Well, I got a list of all the permits in SWVA years ago. And it's amazing how many of those are sitting idle. And they're allowed to sit there for a long period of time.

There are those who see reclamation efforts as successful, and those who express concerns about how reclamation is done.

Dust/Air Pollution (28 Quotes, 5 Groups, 12 Participants)

Participants in both group types agreed that dust is a problem with surface mining. However, there were differences of opinion within and between group types about how well dust is controlled. Specifically, pro-surface mining participants from Virginia maintained that the coal industry does a good job of following regulations to keep airborne dust to a minimum:

> The dust used to, if you were on a strip job, there was float dust, which is about the consistency of baking flour, six or eight inches deep on the road, any vehicle that went through it, it would clog up your filters, it would just ruin the equipment. Now, there's water trucks that have four or 5,000 gallon tanks on them and they go back and forth and they wet those roads all the time. At a blast site, before they blast, they flood that area. Just put lots of water in there. Some of the ways they blast anymore, once they put the explosions in the hole, they fill them up with water.

Other pro-surface mining participants were more concerned about the dust. Some agreed that the coal industry does attempt to minimize dust; however, they seemed less convinced that these efforts were effective:

> But as far as the working right there on the mountain…even the kudzu gets dirty, around his place it's all kudzu because it's [near] an old mine. An old deep mine. But, yeah, the dust is real bad. But they do keep the roads watered when they're hauling coal out of there.

As one pro-surface Kentucky participant stated: "Where I live at, the blacktop ends. So, when a coal truck comes, the dust starts stirring right there at my house." Another participant from Kentucky had a similar opinion: "We don't live as close to the [surface mine] around our house, but we still have a bad problem with the dust."

Those in the anti-surface mining groups had many complaints about dust: "Everybody who comes from out of this area and comes here and looks at this place and wonders how in the world people can live in a community where it's so dusty you can't breathe" (VA). Virginia participants reported going so far as to investigate the extent to which dust was affecting their communities: "We took dust studies in our community proved that the dust was three times higher than the national average." Another Virginia anti-surface mining participant talked about electrical issues his neighbor had at her home due to dust:

> [Her] breaker box was outside her house…you know on her front porch. And her breakers would actually blow up from the dust. They would burn and the coal dust would get into the breaker, into her main breaker boxes and then once....I was an electrician in the mines....and once that dust crosses the phases or whatever you want to call it, the electricity just burns and would blow her breakers out. She was subjected to that.

Those in Kentucky and West Virginia also mentioned problems with dust. One participant reported that her daughter could not even go out to play in the yard without covering her face because the dust was so bad near their home: "And not only that, when she got big enough to go outside and play, like on her swing or anything, it was so dusty over there that we had to put a handkerchief across her mouth and nose so that she wouldn't breathe that stuff in."

A participant in West Virginia also described how the excessive dust created by surface mining processes affects children:

> I'll never forget watching some of the film during the Upper Big Branch thing when they were at Marsh Fork Elementary. One of the reporters took his finger and went across the school window sill and had it covered with coal dirt. Here's people, also people that we've met…standing up fighting for what was happening at that school. And we read the articles in the paper that the teachers wrote telling them how good it was there. That that was nonsense. And here was that reporter taking that finger and showing it up to the nation.

Damage to Homes (25 Quotes, 5 Groups, 10 Participants)

Participants from both group types mentioned home damage as a consequence of surface mining. This sub-theme is included here although home damage is related to the built environment and not the natural environment. This sub-theme fits better with the Environmental Wellness section of the wellness wheel than it does any other as the condition of one's home is an very important aspect of one's everyday environment. Those in the pro-surface mining groups discussed ways that surface mining affects homes near mining operations:

> Strip mining, when you have it near your home, there's no question about it. It's a scourge. I don't care how good you blast or anything. You mess up the foundation of people's homes. You do. It's just fact. Mine's out there (VA).

According to these participants, one's home can be negatively affected both by blasting, by rock slides, and by the dust that blasting creates. This pro-surface mining participant from Kentucky describes how dust has damaged his property:

> And it will destroy your house if you don't keep up and get the dust off of it because I've got the same problem right now. It cost me about $400 last year to keep my pool with sand in the bottom of it because of the dust off the coal trucks where they strip by my home. They're going to be within like 75 yards by the time they get done (KY).

Another pro-surface mining Kentucky participant describes how blasting and rock slides can totally destroy a home:

> Well, you see at least once or twice a year somebody's home is destroyed by blasting. A rock coming off on their house or like you was talking about the ponds, they don't fix them right, and then you've got a big slide comes off that destroys your home (KY).

Some of these participants have faith that the coal companies will help with such home damage: "They pay for your foundation if there's an issue" (VA). Others are not as confident in the coal industry's willingness to fix damage to homes: "They've been there about five years and all the hard blasting, it pops the tin on my home and everything. But they try to hide all that" (KY).

Those in the anti-surface mining groups also talked about home damage because of surface mining. In fact, some in these groups reported losing their homes altogether to surface mining operations:

> Well, I used to live not too many miles right up here and had three strip jobs blasting and they literally blasted my house apart. I got pictures of all this. I had a nice home and me and my son had re-done it. It was one of the coal camp houses, but I bought the whole house. You know, 2 families lived in them back then when the mines and stuff was running years ago... And my house, what's left of it, is buried up there in a slurry pond.

My beautiful home. They blasted it apart in '04…Yeah, it blasted my house plumb apart (VA).

Others talked about how they have struggled to maintain their homes even as they continue to experience the negative effects of surface mining: "Well, right now we need to put support under ours. It shakes. You walk through the house and it shakes" (KY). "Our whole house is falling apart now" (WV). "You can see cracks in the walls" (WV). "Yeah, they didn't fix it back right. The trailer just ain't the same…It seems like the ground is sinking" (WV). "Well, I just spent $8000 dollars on mine to get it braced back up" (KY).

Still others in the anti-surface mining groups described how surface mining activities negatively affected their yards and gardens: "He had a beautiful garden in his backyard. He's got blackberries about that big. Beautiful garden. They come right in his back yard there on the hill and boulders just rolled right down there. They were covering him up" (VA).

Flooding (14 Quotes, 5 Groups, 10 Participants)

Flooding was discussed in the focus group interviews as another environmental consequence of surface mining. Flooding was not seen as a major problem by most in the pro-surface mining groups, although one participant in the pro-surface mining Kentucky group stated that frequent flooding was a problem for his family. Two group members in the pro-surface mining Virginia group had this exchange: "I think there's no more [flooding] now than it was then." "Probably less. There's less flooding now." A pro-surface mining participant from West Virginia reported family members who live in other areas of the state being affected by increased flooding that he believed was related to surface mining.

Participants in the anti-surface mining groups saw flooding resulting from surface mining activities as more of a problem: “Well, it's like Logan there last week, and a bunch of other places…I mean there ain't nothing there to hold that water back” (KY). Another Kentucky participant reported increased flooding near her home after surface mining began:

> But after they started stripping and stuff we've had I don't know how many floods come. I mean it washed the drain tiles and everything out. And it even got in our basement, and we didn't know it until we went down to change the filter after it started getting cold. We went down to put a filter in the furnace, and there you could tell the water had about got up to the wiring on the furnace. It was what about four feet deep.

Participants in the anti-surface West Virginia group also reported direct experience with increased flooding:

> This was right after a flood is why [several state politicians] came here. This creek was wiped out, and they was looking at all this damage. Sewer systems tore out. Water systems tore out that had just been installed back through the Abandoned Mines Funds project. Bridges washed out. FEMA had to come in here. The federal government had to come in here…that's the part of coal mining that's never told.

Another West Virginia participant talked about her experience with flooding after surface mining began near her:

> We got flooded [in ‘09]. And another thing because of the mines behind us, out of all the hollers, every one of them…our house was the worst one when it got flooded. But [my daughter’s] room, and her brother's room... they had to take the window out and re-do that whole thing.

Participants in Kentucky and West Virginia reported directly experiencing significant flooding, but flooding was not seen as a significant problem by most members of other groups.

Loss of Animal and Plant Species (14 Quotes, 7 Groups, 4 Participants)

Many participants expressed concern over the loss of animal and plant species resulting from surface mining activities. A participant in the pro-surface mining group from Virginia talked about the need to conserve even though he denied being concerned about protecting every species: "Now we might kill a snail darter or something like that, but…you know you may move those things." Other pro-surface mining members expressed concern about species loss. One participant from West Virginia expressed worry over the potential loss of fish but couched his concern in the fact that species loss has long been a problem in his area so that further species loss to water pollution through surface mining may not have that big of an impact on people:

> And I figure it won't be much longer and all the fish will be gone, and everything else unless they do something about it. But at the same time, there's this big question: there haven't been any fish on [this creek] for years, and they've got a few fish up there now. Won't be much change up there because if they haven't been for years, nobody will notice much difference if they all disappear again.

Those in the anti-surface mining groups also expressed concerns in this area. A participant from Virginia said it this way:

> You could go to any of these creeks and catch you a mess of fish. You could go and catch you some animals to eat. And people did that. And you can't now that the creeks are dead with toxic waste and stuff that comes of the strip jobs and killed all of that stuff. The wildlife and the animals and everything, they're dead (VA).

A participant from Kentucky mentioned the loss of crayfish in the creek near his home: "Crawdads? What are those? They're not even in there anymore." Participants in the West Virginia group lamented the loss of crawdads as well, along with the loss of ginseng.

Forest Loss/Logging (11 Quotes, 4 Groups, 8 Participants)

Another environmental consequence of surface mining that participants brought up was forest loss related to the logging done for surface mining operations. Pro-surface mining participants talked about forest loss resulting from logging operations for surface mining: "The timber companies, there can't be not one tree on the mountain when they mountaintop remove it. They devastate the mountain. They've got to take all the trees off" (WV). These participants also talked about changes in the forest through surface mining operations and the reclamation of mine sites: "One of the problems that we have had over the years is the reclamation people have brought in invasive species of trees that we are now fighting tooth and nail...and they're worthless, they're worthless" (VA). A West Virginia participant talked about other long term problems stemming from clear cutting for surface mining:

> The lumber companies, when they go through, they're told to cut down every fruit tree and every nut tree when they come on there. They're supposed to cut it down and leave it laying. It takes up nutrients from the oak and the hardwood that they actually need so, they just destroy all that. All the nut and fruit trees are destroyed (WV).

Those in anti-surface mining groups discussed the problem of forest loss as well. Two anti-surface mining participants from Virginia put it this way: "They went around up here and got them logs, you know before they stripped, sometimes, like my house, they just pushed them up in a pile there and burned all these huge trees." "At one time, it's not been a couple of years

ago, [one coal company] alone was cited for destroying over a million trees behind one of their plants. There used to be 600 trees an acre back there."

Some in the pro-surface mining groups saw possible economic gain from reclamation efforts: "That's another thing that we do a lot of here is logging. Coal mining, you're going to log before you're going to strip it. You're going to put back trees that you can come back in 50 years and harvest again" (VA).

EPA/Politicians/Laws for or against Coal Industry (14 Quotes, 4 Groups, 7 Participants)

Pro-surface mining participants mentioned this sub-theme much more frequently than did anti-surface mining participants, but they see the issue fundamentally differently. Most pro-surface mining participants who mentioned the political influence on the coal industry strongly believed that government forces oppose and strictly limit it. As one Kentucky participant stated:

> But even the EPA now they're trying to make it to where you can go into a holler and take a water sample, and then mine, but they want you to put the water back better than it was before they started mining…The EPA is trying to make it so strict that they are eliminating mining.

Those in other groups expressed similar opinions:

> You can't prove it by these politicians now because really they're cutting our throat in a lot of different ways. They're dead against mountaintop removal. They're really killing this state. That's all this state is: coal. They're wanting to do away with it. I think they need to go about it differently. But we do need it (Pro-WV).

Some participants in the pro-surface mining groups expressed beliefs that the government is working to end coal mining completely: "You kind of wonder at times about some of the things that's happened. Obama's trying to get the coal mines shut down" (WV).

Comments about this issue in the anti-surface mining groups were almost directly opposite of those made in the pro-surface mining groups:

> And the EPA was, the whole idea of the DEP in West Virginia, the DEP was formed for 2 reasons. One, is to protect the industry and to make sure they operate and don't get false lawsuits. And the other part is to make sure they don't make violations to cause a lawsuit. But when they testify with lies against average citizens they have become a force of evil. And that's what the majority of them are. You stand and you see the stuff that's flooded down on ya, and the trees that came off the strip stopping up the drain, and their report. And people at first don't see at first the reports. How it's written up. You can go down there and look and you get to see the reports. Then you find the lies (Anti-WV).

One participant in the anti-surface mining Virginia group expressed the belief that President Obama and the EPA were trying to enforce the laws on the books and did admit that when these laws are enforced it creates hardships for the coal companies:

> Of course the EPA, now, you have to give them credit. They have tried and they are trying and their catching it from everywhere, except the President…They're catching it from all sides. Every ore producing industry in this country is after the EPA because the EPA and what they're doing in enforcing these laws is creating hardships.

In general, beliefs about the extent to which government agencies enforce surface mining laws and about the political attitude of the government towards coal vary strongly between group types.

Landslides (10 Quotes, 4 Groups, 6 Participants

Landslides were a problem mentioned by some participants in both group types. Some group members complained about landslides as a problem brought about by reclamation practices. A pro-surface mining participant from Virginia stated:

> And the way they're getting the water to go into [the ground] when they're leaving [the spoil] loose. That's good. It's better than letting it run off, but when water gets in underground and so forth, it's a lubricant. And that stuff's up there and so when it gets fluidized semi or when it gets water where the rocks have friction and so forth when that gets wet it's just lubricant. It's gonna slide. It's gonna move (VA).

A Kentucky pro-surface mining group member compared surface mining to deep mining in terms of negative effects and concluded that surface mining had more negative environmental effects with one reason being the potential for rock slides: "Surface mining [is worse] because you know you have more problems with the slides and rocks." Participants from the pro-surface mining West Virginia group concurred with participants in the other two groups:

> Now, behind my house they've done that. The slurry will run out the coal seams and will slide down the side of the rock. It will cause landslides. There has been a landslide up behind my house, a landslide up the road from me and everything else.

Those in the Kentucky anti-surface mining group shared concerns similar to those in the pro-surface mining groups: "Every time it comes a big, hard, heavy rain, here comes the mud,

and dirt, and rocks" (KY). One Kentucky participant expressed concerns that some surface mined areas have the potential for substantial slides that could be quite damaging:

> It's like a contour and auger mine, but it's literally about 50 feet from U.S. 23. That's where the actual rubble is. Like in a huge storm event, it's loose, loose, rubble. In a huge storm event, that could completely decimate a major thoroughfare through that part of the state.

Economic/Occupational Wellness

Although the wellness wheel only listed "occupational" as an aspect of economic wellness (See Appendix A), there was much talk about economics in the region across the groups. Due to the wider scope of the economic issues expressed in the focus groups, the word "economic" has been added to the title of this theme. Participants on both "sides" seemed to recognize the importance of coal for the economy and many saw no other options for work in the region. The power that the coal industry has in this type of single industry system also presents some problems that are discussed by participants. The following sub-themes capture the participants' perspectives on the economic realities they face and on some of the consequences of these economic realities in the region.

Coal is Economically/Occupationally Crucial in Central Appalachia (88 Quotes, 6 Groups, 19 Participants)

This sub-theme had more quotes than any other sub-theme. Most of these quotes came from pro-surface mining groups. Many participants asserted that coal mining is the main economic driver of the region and that without it, the economy would crumble. This was especially the case for those who supported surface mining. As a member of the pro-surface

mining Kentucky group stated:

> If they didn't have [surface mining] around here, the people here wouldn't have no money. If it wasn't for the coal industry, everybody around here would be dirt poor and wouldn't have no shoes, because there ain't no other way for a man to make any money.

A participant in the pro-surface West Virginia group made a similar comment: "They are furnishing people jobs. I mean, that's the only kind of job in this state that pays anything. Why would you cut your own throat?"

Some participants asserted that the other businesses and organizations in the area would not be able to survive if the coal industry stopped operating mines: "That's another thing, I mean, you take coal business out then the schools are going to go out, the restaurants are going to go out, gas stations are going to go out, then what are y'all going to do?" (Pro-KY). Those in the pro-surface mining groups saw surface mining as an integral part of the mining industry that sustains the region.

Those in the anti-surface mining groups also spoke to the powerful force that coal mining is in the economy of Central Appalachia:"It is astronomical the amount of the tax base that you would have to replace in this county [if coal was no longer being mined]" (Anti-VA)."They've got it sort of like a monopoly on this business of coal" (Anti-VA). "People are just out there trying to make a living for their family. And they say that's all that's around here." (Anti-KY).

Participants, particularly those in the pro-surface mining groups, talked more specifically about the lack of other gainful employment opportunities that exist in the coal-dominated Central Appalachian economic system. As one pro-surface mining Virginian described: "It's just hard to go to another place, and when you get out of high school, you pretty much have a [mining] job

and you can probably make $50,000 and be about 19 or 20 if you want to." According to this participant, coal mining not only pays well, but the alternative to coal mining is to move somewhere else to work. One pro-surface mining Kentucky group member put it this way:

> Well, money is another thing around here. You know people stay in the mines just because of the money. Yeah, you might could find a job at Wal-Mart, not saying there's anything wrong with working at Wal-Mart, but it can't compensate for...say you got that house payment and a car. You lose your job in the mines, you can't survive making it at Wal-Mart.

Even the few other options that are available may not meet financial needs and very likely will not do so as well as mining would. As one West Virginia resident stated: "You almost have to be retired to live here. Unless you want to work in the mines."

Those in the anti-surface mining groups talked about the issue less frequently, but those who did mention it generally stated that lack of other employment options is a problem in the region. "[Surface miners] want to hold on to jobs—I don't blame them. I was laid off a job for 18 months…I'd work too" (Anti-VA). According to this participant, current surface miners would have few other options for work should they lose their jobs.

Participants further emphasized the economic importance of coal as they recalled days of outmigration when coal production was down. Members of both pro and anti-surface mining groups talked about the history of outmigration in the area. One pro-surface mining Virginian stated:

> And that's the reason most of our ancestors is in Ohio or Michigan or Washington, DC. Just anywhere you had a relative that had moved, that's where you went, because you had

somewhere that you could stay a week or two until you got a paycheck.

Another pro-surface mining participant from Virginia talked about his personal experience leaving the region then returning when coal production through surface mining began to increase. He talked about what it would be like for him if this increase had never happened: "I'd be working in Chicago: that's where I left just before I came here. I'd have left mining and went there." This participant, like others, moved away for work and returned as soon as employment in the mining industry was again possible.

Pro-surface mining participants from West Virginia talked about how many people left their community when coal mining production decreased in the area: "You can go up there where I worked, and there's not even hardly evidence, and there were probably 1,500 guys that worked up there in that area. You can't even see the evidence." "There were more people [this mining town] than there were in Charleston, in the capital." Several participants were able to recall being taught about outmigration as a necessity for survival or success: "They taught you reading, writing, and Route 23," stated a pro-surface mining participant from Virginia. Another pro-surface mining West Virginia participant expressed learning similar ideas and finding them to be true:

> There's an old saying in West Virginia, you either go coal mining, moon shining, or moving on down the line. And what we found out was, yeah, they're raising marijuana and moonshine, and a lot of people work in the coal mines. And all the people who can't work and get decent jobs who finish high school or get a college degree leave the state. And they don't come back. So that leaves either you're in school, or you're retired.

An anti-surface mining participant from Kentucky talked about his experience of leaving the

region because he was taught that leaving would be necessary:

> I left the region when I was 18, actually before even finishing high school, I left on my own because I was one of the young people around here that was brought up to think that if you wanted to have any opportunities you had to go elsewhere. This is where my family's from and all that kind of stuff, but to move up, you had to move out.

Participants remembered periods of outmigration due to changes in coal production or lack of opportunities in the region.

Several participants expressed fear that declines in surface mining would lead to another coal "bust" and that another surge of outmigration would again be a problem. As one pro-surface mining Virginia participant stated: "Without the stripping…they'll be exodusing us out of here again like it was in the 50's and 60's." This feared outmigration would only add to already high levels of population loss brought about by the lack of economic opportunities in the region: "At one time there were 150,000 people living in this area. Now, there's 5,000," stated one pro-surface mining West Virginia participant.

An anti-surface mining participant from KY echoed the reality of this population loss: "You know, population's just, people's moved away." Anti-surface mining participants addressed this issue much less frequently, but the opinions they did state generally aligned with the opinions of pro-surface mining participants. Participants remembered how many people have left the region during times of sluggish coal production, and expected similar patterns of population loss should surface mining decrease or end in the area.

Directly connected to the concerns about outmigration outlined above, many in the pro-surface mining groups see continued surface mining as part of the answer to the problems of

unemployment and outmigration. As one pro-surface mining participant from Virginia stated: "Strip mining gave me the opportunity to come home." A pro-surface mining participant from West Virginia also talked about the opportunities surface mining brings: "It affords people a good living. You could probably make about 150,000 dollars a year working in the coal mines." Some in the pro-surface mining Virginia group asserted that mining jobs are currently prevalent in the area: "If somebody doesn't have a job in this area, just about they don't want to have one." Similarly, "We're short of miners right now. I mean you turn on the local television and they'll probably be at least three mining companies advertising" (Pro-VA).

There was a good deal of difference in opinion among participants about the prevalence and availability of surface mining work, however. These variations arose even amongst pro-surface mining participants. A member of the pro-surface mining Kentucky group put it this way:

> But now on the surface, one thing about it, it's a lot harder to get a job on the surface. I've had my surface card for 12 or 13 years, and if you can't run a piece of equipment or you don't know somebody, you're not getting a job on the surface.

Anti-surface mining group members did not talk about this subtheme frequently, but those who did were not convinced that surface mining is creating many jobs in the region. An anti-surface mining participant from West Virginia stated:

> But the big story that they feed all the people is about jobs, jobs, jobs. And anyone who goes into the details about mining will tell you that it's at least 2 to 1, some people will say 3 to 1 jobs that are produced between surface mining and underground mining. For every ton of coal that's produced in surface mining, it would take 2 miners underground

to produce that much, at least. I'm giving you the conservative side.

This participant did not believe that surface mining is creating many jobs, especially in comparison to underground mining. Another anti-surface mining participant, this one from Virginia, commented about the need for fewer workers on surface mining jobs: "Science and technology's took over the jobs and also took over the money" (VA).

Those Who Oppose Coal Industry in Any Way Face Harassment and Threats (31 Quotes, 5 Groups, 11 Participants)

Perhaps directly related to the beliefs espoused by the participants about the economic necessity of coal in the region, those participants who had spoken out negatively about surface mining reported that they were often met with an oppositional response by other residents. Those who speak out against surface mining also reported being frequently met with hostility by those in the coal industry. Participants who have openly opposed surface mining reported many instances of harassing or threatening behavior from people associated with the coal industry and from their neighbors. One participant whose family had openly opposed the surface mine near their home stated the following: "Well, when they were running their trucks and equipment over there…we would get run off the road, we would get held up, they would hold us up and make us late for work, we'd get threats" (Anti-KY).

A participant in the anti-surface mining WV group described the action mine employees took against one of her neighbors who stood in opposition to surface mining: "They put her picture up at the mine office and told them: 'This is the person that's trying to take your job.'" One retired miner from Virginia described the actions taken against him for speaking out against the surface mining near his home: "They threatened to put me in jail for speaking out against

them trying to mine coal behind my house and blow my house down and destroy my home" (Anti-VA). A participant in Kentucky and one in West Virginia mentioned that their children were called "tree-huggers" at school because of their opposition to surface mining.

Even some who supported the surface mining industry in Kentucky reported facing harassment when making complaints about some of the practices on the surface mine near their homes. As one participant put it:

> The thing of it is, if you make those guys on the strip job above your home mad, they can make you live hard…You make them mad and you meet them coal truck drivers, they'll get you off the road.

Even though residents may support the coal industry and surface mining in general, they reported that speaking out against the companies in any way had potentially negative effects.

Those Who Oppose Surface Mining Do Not Have Political Representation (28 Quotes, 3 Groups, 9 Participants)

Participants in the anti-surface mining groups across states asserted that they do not believe that their opposition to surface mining has any political weight or that their complaints about mining practices are really considered by those in power. In Virginia, participants talked about measures they had taken to protect themselves and their homes from surface mining: "I met [the senator] down here, I wrote him a letter …The only thing that come out of that was that he said that he didn't want to commit political suicide."

Another Virginia participant commented:

> The beliefs that we've had all of lives that the government is there, they're here to help anytime, and it destroys your belief in government, state and local especially. But it

> destroys your belief in the system that's supposed to protect you. It's supposed to step in when they're, obviously just looking, they're destroying everything around you and they say it's okay.

Those in the Kentucky and West Virginia anti-surface mining groups shared similar perspectives. As one Kentucky group member stated:

> It's probably not all areas of stripping and auguring that they have it, but this area back in here your elected officials and everything else is for the coal companies… They don't care about people living down there, where we're at anyway. Now, maybe in the heavier populated area it might be a little bit different. But they sure don't care nothing for us .

In West Virginia, participants expressed frustration about the governmental agencies that were designed to help regulate the coal industry:

> I had [him] at my kitchen table 10 years ago tell me that I was just wasting my time fighting this permit because [the company] was just going to come in and wipe my whole holler out. And that's the guy from the DEP [Department of Environmental Protection]…So, yeah, they try to put the fear in you.

One pro-surface mining resident of WV commented on the "dirty" politics of West Virginia, but he did not specifically discuss this in relationship to his political interests.

Emotional Wellness

Participants in both types of groups described considerable impacts of surface mining on emotional wellness. Although the anti-surface mining groups had the most to say about this topic, those in the Kentucky and West Virginia pro-surface mining groups also talked about how surface mining harmed their emotional well-being. Those in the pro-surface mining Virginia

group remained virtually silent about emotional effects.

Ambient Stress (28 Quotes, 6 Groups, 12 Participants)

Participants in both group types reported experiencing stress. Ambient stress refers to stress that arises from everyday living conditions. Aside from anti-surface mining participants reporting experiencing ambient stress more frequently, there were no significant differences between groups in the types of everyday stressful problems that they reported. One stressor that was mentioned frequently was the noise associated with surface mining operations: "I hear them about 24 hours a day just about, you know, that's the way of life in the coal counties" (Pro-VA). "If you ain't somebody that wants to get up about 6:00 every morning, it's really aggravating because they start about 5:30 every morning" (Pro- KY). "And now, right now, I don't know if I could sleep if it was quiet. Those coal trucks coming over there. Sounds like a metal basketball. Boom, boom, boom all night. 24 hours a day" (Pro-WV). "I actually liked those cold nights, we'd raise our windows and turn on the ceiling fans. But when the mining was ongoing you couldn't do that because all of that smell and that sound drifted into your bedroom" (Anti-VA). "And then the blasting, continuous noise, a lot of dust" (Anti-KY).

A few participants also reported ambient stress in relationship to coal truck traffic issues, having to haul water due to well pollution, and the lack of utility services and road maintenance in communities shrinking in size due to MTR. Also see the section on Dust in the Environmental Wellness section as dust contributes to everyday stress levels.

Powerlessness (31 Quotes, 5 Groups, 12 Participants)

Powerlessness was an emotion expressed across group types and one that was mentioned very often by those in the anti-MTR groups. In the Kentucky and West Virginia pro-surface

mining groups, participants expressed feelings of powerlessness often because of the lack of other employment opportunities in the region. Some of the quotes from Kentucky pro-surface mining group members on the topic are as follows: "So you just about have to accept whatever they dish out to live around here." "We have no other choice." "But we just try to take it. Hoping that in about 15 years it just moves on by." "Well, if you ain't got a job, you can't afford to take them to court." Those in West Virginia commented similarly. "If you want to live and provide for your family, it's like they've got you." "You might not like it, but you've got to do it." One West Virginia pro-surface mining participant linked this feeling of powerlessness to absentee ownership of the land:

> A lot of people may say they're for [MTR], but they have to say that. They're forced to say it because they live on company property. Most of the people in this area do not own their property. It's owned by the coal companies and the land owners.

Those in the Virginia and Kentucky anti-surface mining groups also expressed feelings of powerlessness. Many of these participants have put in considerable effort to fight the coal companies who are surface mining near their homes but do not believe that they have achieved much success. As one Virginia participant stated: "I've filed I don't know how many complaints down there, and I've had hearing, after hearing, after hearing and it's always that same thing you know. They'll rule with the company every time." Other Virginians shared similar feelings: "It's kind of the same thing that we've been talking about because you're feeling like whatever you do is not going to make that big of a difference and your voice isn't being heard." "You'll get a form letter that says that they promote economics. So, where does that leave you at? The last two

letters is expressly to the EPA. No response from them." Those in West Virginia also voiced feelings of powerlessness in their fight to protect their homes and land:

> …I don't have money to fight them with. So, I went…to the surface mining board for a hearing, and I asked them to declare my lands unsuitable for mining because there are laws on the books, the SMCRA laws, that there are lands that are unsuitable for mining if it's agricultural or something like that, but they said, 'no, the mines aren't going to hurt you at all.' But you know I've lived it. I've seen it happen to my own family, my own community, to people that I've known all my life.

An anti-surface mining participant from Kentucky expressed her feelings of powerlessness this way:

> It's like the law enforcement, all the enforcements and stuff like that don't care. They can get by with murdering people as long as it has nothing to do with hurting the coal. We could be murdered and it wouldn't matter. Nobody would investigate it. I feel that way….Only thing I could hear them saying is, well, they should have kept their mout shut. Or, they should have sold out.

These feelings of powerlessness might be best summed up by the following quote from the Virginia anti-surface mining group: "We cry, nobody hears those cries."

Despite these feelings of powerlessness, several anti-surface mining participants seemed to draw strength from continuing to stand up for their beliefs and to openly oppose surface mining. One participant from Virginia described his actions after he was threatened with a lawsuit by the coal company for his opposition to surface mining near his home:

> As stubborn as I am about certain things, [it] made me decide well, if they had of left me alone I probably would have quit, but since that happened I was not going to quit. And I still will speak out against an injustice whether it's against me or it's against somebody else.

Another participant from Virginia described her position on the matter:

> I am here today because my head and my heart will not allow me to do otherwise. I may not change a thing. I can't say that we've changed a whole lot in ten years. But I have to look myself in the mirror. And I have to say, you were not successful, but you did everything humanly possible that you could think of to do in order to try to bring about change (VA*).

A participant from West Virginia described the changes she had seen in another participant who had begun to speak out against surface mining practices: "But I'd also seen the empowerment of 'I'm not going to take this,' and just telling your story with honesty. And there was a glow of health about you. I'll never forget it." A participant from Kentucky said it this way: "Whatever you want to do, that's great. We'll take it, but it's not going to stop us. And so, I'm sorry, I get fired up on this stuff." Even though participants in both group types voiced powerlessness, those who continued to fight against surface mining practices drew some empowerment from this stance.

Fear/Anxiety/Traumatic Stress (27 Quotes, 5 Groups, 13 Participants)

Another emotion mentioned primarily by those in anti-surface mining groups, but also discussed in the pro-surface mining groups, was fear. Many of these feelings of fear were related to worry about the possibility of sediment pond breaks. One anti-surface mining participant from

Virginia talked about fear in relationship to sediment ponds: "They're going to put three sediment ponds in, which is over ten million gallons of water in that narrow holler. Either one of them breaks, I'm gone. If it rains, I'm going to be sitting there scared to death that it's going to bust. It's that dirt dam." Similar fears were expressed by this anti-surface mining West Virginian participant: "I really am scared especially since I have my little boy, because I'm like, what if the dam busts? I'm dead." Participants referred to the Buffalo Creek Disaster and were well aware of where the impoundment ponds were located in relationship to their homes and what the effects of a slurry pond break would be (Erikson, 1976). The Buffalo Creek Disaster was a massive flood in Logan County, West Virginia in 1972 that was caused by the failure of a huge impoundment pond. This disaster resulted in over 100 deaths and in the destruction of thousands of homes (Erikson, 1976).

These fears were mentioned by pro-surface mining participants as well:

> Biggest thing here is the impoundment ponds. They build these big ponds, like they were talking about, with this slurry. They build these big ponds back in these hollers where nobody knows about. Billions of gallons of toxic water and it's just an earthen dam. Now, when those break, then you have to be worried (Pro-WV).

Participants in both types of groups also reported fears related to blasting. As one pro-surface mining participant from Kentucky said, "[Blasting] even startles me and I ain't afraid of nothing." Anti-surface mining participants from Kentucky echoed this fear: "I think [the blasting] was scary for all of us."

Other fears in relation to surface mining and its effects were expressed. For example, this participant from the anti-surface mining West Virginia group talked about her fears after becoming ill from ingesting polluted water:

> And next day the doctor come in and [tearful] and my daughter and my daddy ended up coming in and talking to me and hearing the doctor say that I was walking around dead. That I was dying. And that really does something to all of us. We did call my mom and [son] and told them, and it really got scary...So I thought what's going to happen to my kids? And they definitely weren't going to go with their daddy. I didn't know if my mom and dad could watch them or whatever. It was just really scary…It's just a lot of fear.

Others expressed more general fears about multiple potential effects of surface mining: "And there are nights when I wake up, and I'm scared, and I think am I going to wake up tomorrow and they're going to be blasting the top of that hill? Is somebody going to run up here and poison my water system?" (Anti-WV).

For some the fear associated with MTR operations seemed to engender an traumatic stress response. Although this type of stress was discussed less often than was ambient stress, several participants talked about severe stress reactions to mining processes. For some, blasting reportedly brought on an intense stress response. Once again, this type of stress was mentioned less frequently in the pro-surface mining groups, but there were not fundamental differences between types of groups in the comments that were made:

> And their blasting? It totally scares [my wife] to death…Because you don't know at that moment if they're going to let off that blast. You might be just sitting there thinking about somebody that's passed away or something or another then all at once everything just

goes to rattling. And that puts your heart into that racing mode right there you know (Pro-KY).

Others described even more intense reactions to blasting:

My daughter's husband's sister lived close by in this community, and my daughter told me this after her sister in-law-died…She told me, she said "Daddy, I firmly believe that blasting and dynamite killed [my] sister-in-law." She said "I've been to her house when they'd blast, and she'd go all to pieces." And so they found her dead one morning in bed (Anti-VA).

A participant in West Virginia talked about the reaction that her father had to an unexpected blast:

So, the main thing that happened was that my dad had a heart condition anyway, and they're supposed to let off the warning signal before they blast. They're not supposed to blast after a certain time in the evening or on weekends. Well, it was like 7:30 that evening, my dad was getting out of the bathtub. They let off one of the loudest booms that they had done. He fell and took a heart attack (Anti-WV).

One participant described her mother's reaction to the blasting: "And then would come the sirens, the sirens with the blast. And she'd sit there just watching. And it was like she was in total shock" (Anti-VA) Though these type of acute reactions may not happen to all those living near surface mining operations, significant stress responses were reported by these participants.

Solastalgia/Sadness/Grief (15 Quotes, 4 Groups, 10Participants)

Those in both group types mentioned experiencing sadness in relationship to surface mining. In the pro-surface mining groups, only the West Virginia group mentioned this

emotional experience. One West Virginian put it this way: “You live in a town and you're buried there and your roots are there and they just bulldoze it all down and then tell you, now if you want to, you can move back.” Another summed up the feeling of solastalgia: “But the home we knew is memory.”

These feelings were expressed across the anti-surface mining groups. One Virginia participant described her experience of solastalgia in this way:

> But what it does to human beings, it's the same thing they do to the earth. They destroy you. Your body, your soul, and your spirit are as destroyed as the land that they rip from you… And for some of us, it hurts. It literally hurts. When you cry and you sob, they would laugh at that too. But when you cry sometimes it becomes so painful it's like a sobbing and you literally feel a human pain in your being. But what you're mourning is a loss of an environment that is like home to us (Anti-VA*).

A participant from Kentucky described the emotional effects of surface mining as follows:

> I think it has a really kind of deep effect on people that most of us don't even realize. Especially just from growing up around it and having it in the back of your mind, in your subconscious, that that's how the land is treated around here. And I think that that has a direct connection to a lot of the other problems, social and the other problems in our area. Everything from rampant, rampant drug abuse, major problems with prescription pill abuse, issues with depression and those kind of psychological issues. I think that the way that the earth around you is treated has a direct impact on your spiritual and emotional well-being.

This participant directly linked the treatment of the land to the mental health of those who live on it. Another participant from Kentucky poignantly described the emotional pain involved for him when he lost all he had to surface mining. He began to cry as he said: Then one evening, I…lost everything I'd worked 39 years for. [We] didn't have but what was on our backs.

Those in West Virginia also shared feelings of grief and solastalgia:

> I love the way the mountains was before they started this. I loved our mountain culture and heritage, and when they started blasting these mountains off there was places that we used to go that you couldn't even get in. They were busy destroying. And then you'd go back, and you'd look to see what was left after they were finished, and you'd see the things gone that you knew.

For this participant, surface mining destroyed much that was familiar to her, much that marked her home as her home. Another West Virginia participant described the experience of her mother on the night that she died. Her mother had been displaced by surface mining and was living away from the home in which she had spent most of her life:

> The night my mom died, I held her head in my lap. She cried wanting to go home. I said 'mother, you are home.' And she said 'no, I'm not home. I want to go home.' That does a lot to you when you see your mom and your dad so pitiful when they worked all their life—good, strong, honest people. It's not just my parents that was done that way. It was my whole family and friends I knew and communities I knew.

For anti-surface mining participants and for pro-surface mining participants in West Virginia, changes to their home and community as a result of mining practices engendered emotional reactions of grief and solastalgia.

Ambivalence (16 Quotes, 3 Groups, 5 Participants)

Ambivalence was a major theme in the pro-surface mining group in West Virginia. This is the only pro-surface mining group that expressed much ambivalence but for them, it seemed to be a major struggle. Here are some of the ways they talked about their ambivalence: "I was an underground miner although I got family in surface. I don't like seeing the mountains tore up, but I don't like seeing families go hungry either." "I figure 85% of people that do surface work don't like tearing the mountains up. But it puts food on the table." "You have to survive. Regardless, you have to survive. It's a good/bad thing." "…It has provided a living, but at the same time, it's destroyed. It's a good and bad thing."

Some participants in the anti-surface mining groups also expressed ambivalence about surface mining:

> People disagree with the environmental effects of all of this to some degree or another, but they won't speak out against it because most people in this area have a conflict of interest. It's like me, for instance. My livelihood comes from my pension, hospitalization, from mining coal (Anti-VA).

This participant both depends on income from the coal industry and disagrees with surface mining practices. Others were in similar situations: "I'm moving the way she is. It started out as surface mining. I wanted it stopped. And the thing we have in common is I and her husband are retired coal miners. Our pensions come from [the coal industry]" (Anti-WV).

One participant described neighbors who still support surface mining despite negative effects as experiencing a form of "Stockholm syndrome":

> There's people that live in this stuff that are still for this. They can't see it for whatever

reason. I think it's something like apathy. My daughter used to say Stockholm syndrome.

Once you get used to stuff you don't want to change no matter what it is (Anti-VA).

Another participant talked about neighbors who oppose surface mining but do not know what to do about it: "And everybody you talk to hates what's going on but they, they're so frustrated that they, because whether they've ever filed a complaint or not that they don't know how to stop it" (Anti-VA).

Anger (17 Quotes, 3 Groups, 7 Participants)

No participant in the pro-surface mining groups mentioned experiencing anger in relationship to surface mining, but this was a recurring theme in the anti-surface mining groups. A participant in the Virginia group described it this way: "I'd just really like to slap somebody. I'd really like to fight back, but I've been in control of my temper since I was in the 7th grade." Another participant from the Virginia group described experiencing similar problems with anger when one of the other group members asked how she felt: "Angry. Very angry. And upset to think that people could say their jobs, but what about your home and your job? What if I'd go and do that to them and their home?"

Participants in the Virginia group also described the chronic, lasting nature of their anger:

> Ask them where they live. Go ask any of these inspectors where they live. I'll guarantee you they're not within ten miles of no strip job. And the frustration, the anger, the emotional impact of knowing what it's doing to my grandkids…And like I say… it creates so much anger and frustration and hatred that it works on you constantly.

Another participant communicated the gnawing anger she feels:

> And part of the reason that you can’t sleep is not just the noise. It's the anger eats at you at night. Now I don't understand this psychologically. Maybe all of your problems are greater at night. I don't know. But I know that when you have a problem and you lay down to try to go to sleep, you can't. It's like it eats at you.

Those in other groups also reported experiencing anger in relation to surface mining. One West Virginia participant expressed anger that he believes other West Virginians who currently support surface mining will be feeling in the near future:

> And we're angry. Do you get that? That we're angry? But the anger's going to come in about 20 years, is when the big anger is going to come—when coal is [gone]. That's when it's going to come. And those that are fighting us now are going to be the angriest. And those who are profiting from it will be gone.

One West Virginia participant who actively fights against surface mining stated that the anger she feels gives her energy to fight it: “I'm like them. I'm angry because they don't live it. And the anger is what fuels me on. After all those years of just being afraid, I thought this is stupid. I'll take this anger and let it work.”

In Kentucky, a participant expressed her anger because her family is not benefitting from the money awarded for reclamation in a lawsuit brought by her community:

> Well, but you know it would make sense that the community that was responsible for getting that money would have been notified, and I'm not getting onto you, but I'm really pissed right now. So you would think that the community responsible for getting the money to be used for that stuff would have been the first place that would have been called and asked if they wanted to do it. And like I said, I'm pissed.

Frustration and anger over a number of issues related to surface mining arose in each anti-surface mining focus group.

Cultural Wellness

Focus groups also addressed how surface mining affects the cultural wellness of those who live near it. Most definitions of cultural wellness state that this aspect of wellbeing involves being aware of one's own cultural background and aware and respectful of the cultural backgrounds of others (California State University, 2012; University of Miami, 2009). For the purpose of this research, the concept of cultural wellness also includes the ability to freely practice and maintain cultural traditions that increase an individual's overall sense of well-being. This aspect of the definition is consistent with other expanded definitions of wellness that include the ability to connect with one's own culture in meaningful ways (Pacific Lutheran University, 2013). Although most of the effects of surface mining on cultural wellness that were mentioned were negative effects, this was not always the case. Participants discussed the importance of place and both the positive and negative implications surface mining has for people's ability to maintain a connection to place. They also discussed the pride associated with coal mining in the region.

The Importance of Place (27 Quotes, 6 Groups, 14 Participants)

Participants talked about the importance of place in their lives. Many mentioned how long their families had been in the region: "Most of us here are just, our families have been here since forever" (Pro-VA). This was also reflected on the demographic form that participants filled out. Many indicated that their families had been in the region for generations: "We're not nomadic people. We do not move. We're planted in the mountains" (Anti-VA*).

This rootedness in the region means that leaving the area either to find work or to escape environmental problems is either very painful for residents or is something they are simply unwilling to do: “The old saying goes there's no place like home, it's true” (Pro-WV).

> This lady had means and ways to go somewhere else and do more. [The reporter] asked her, “why do you live in these conditions?” She said “I'm 87 years old. I was born in this house and want to die in it” (Anti-VA).

> Sometimes I call it a hole in the wall, but I think we're blessed. Because you go to all these other places and it's so busy you just can't get in and out for the traffic, and you can't find a place that you can be alone. I like living in the mountains because there's just a few places left out there where you can absolutely not hear nothing. You just go there to hear silence. I like that (Pro-WV).

Those who do have to leave return as frequently as they can:

> You know people that live here, just like me, I was in the service and everything and all over the world just about, but I never wanted to be nowhere but here. And our people, culturally, you know this is our area, and we've lived here for generations, and we don't want to go nowhere (Anti-VA).

Others who left talked about their eventual return home as well: “I've been gone, I've lived all over the United States, and I've been back a few years now” (Pro-WV). Still others talked about the way those who had to leave for work would return home as often as possible: “Every weekend buddy, 23 was full with all these hillbillies coming home” (Pro-WV).

When participants were asked why they stayed even when they were reporting access to few resources and were lamenting environmental destruction around them, often they answered

with just one word: “home.” This was the case across group types. Some participants from the anti-surface mining groups described in detail what it meant to them to live on their home place and how surface mining threatened their home place. As one Kentucky participant put it:

> My family’s been over there for a long time. We have a family cemetery that we cherish. My mom and dad's buried there, and there's those two valleys that come done on the sides of it and it's right in the center. If we would have sold, every bit of that would have been piled up with rubbish (Anti-KY).

Another participant from West Virginia described how place preserved her family’s traditions for years:

> But in that community, that's where my father's people was at and all his people lived there for generations after generations. And most everybody who lived up through there was kin. I had great grandparents, and grandparents, and aunts, and uncles, and cousins. All those people I was raised up with. We were a tight knit community. We just shared a lot of rituals that was among ourselves like my great grandmother when a baby was born she always had to bath it first. After she passed away, my grandmother took that role. And she even bathed my first born, and to me that was really special. I can still see her little hands just trembling…That was good. That brought joy to me.

After surface mining came into the area, however, she reported that the family lost too much land to continue to live so close together and that they lost many of their cultural traditions.

For those in Central Appalachia, land and a sense of place is an important part of and preserver of culture. A participant in the anti-surface mining Kentucky group described his views about how surface mining is affecting the culture of the people:

> People around here, they don't realize the damage we've incurred culturally because of disrespect to the land. Going from being a people who lived here hundreds of years being closely tied to the land, closely dependent on it, and really having a strong, good relationship with it, to basically having an antagonistic relationship with the land under the guise of needing that for economic development. And I think that's taken a very deep spiritual, cultural toll.

The Loss of Recreational Activities/Access to Common Grounds (22 Quotes, 4 Groups, 9 Participants)

Participants mentioned losing some of their ability to engage in recreational activities like hunting, fishing, collecting wild plants, and riding 4-wheelers. Some of these activities also provide supplemental income, extra food, or herbal remedies for clients which makes the loss of these activities even more of a blow. Participants from both group types lamented these losses.

Fishing and hunting are activities that were mentioned often as being negatively affected by surface mining: “Something else you was talking about the other day, in the last few years you've been fishing out at Carter Fork, and you haven’t caught a fish” (Pro-KY). “When they took the mountaintops off down there, the mountaintops next to the lake, the fish quit biting. You can sit there all night and not catch any fish” (Pro-KY). One participant mentioned fishing when describing the few recreational activities available in the area: “There's fishing and four wheeling, but that's half gone” (Pro-WV). Another participant described the loss of the crayfish he used to catch for bait:

> The other thing I was good at is catching crawdads. I'm a good crawdad catcher and I was a soft shell crawdad catcher. On the hot muggy nights during the summer, crawdads shed.

> They go to the shallow water and on the banks of the creek and they shed and they make great fish bait. So I used to get in the creek down here…and I could catch 2 or 3 hundred crawdads. Soft shell crawdads. And for every soft one you'd catch, there were at least 20 hard ones, so that shows you how many crawdads there were in the creek. You can't do that anymore. That has been wiped out (Anti-WV).

Hunting was mentioned in connection with fishing by one participant. "Hunting and fishing, yeah, it hurts, it takes a real big toll on your hunting. It runs a lot of your game off" (Pro-KY). Another talked about hunting in connection with those who do the surface mining. "They're just destroying the state, but still there's still many members of our family that's making a living. It's not their fault. They love to hunt too" (Pro-WV). This participant noted that his family members working on the surface mines are, through no fault of their own, destroying one of the things that they love to do for fun.

Other participants talked about the toll surface mining has taken on recreation related to plant life. One participant worries about the health effects of eating plants grown near coal mining activities and coal fired power plants.

> Cultural, my goodness, it's those berry patches. That is a part of our culture. Gardening and canning. I'm still doing it. I don't really have to do it economically, but it's become a part of my life from a very young age. I think that gardening and canning is part of that. They destroy our gardening spaces. The coal fired plant drops more mercury. We don't know if there's mercury deposition in the soil, I plant my garden in it, I can it. How does that equate to our health? (Anti-VA).

One important aspect of Appalachian culture has been the ability for people to roam

freely across the land on which they live. For decades, this freedom of movement has been possible even though little of the land in Central Appalachia is actually privately owned by residents (Hufford, 2009). Participants report that surface mining limits access to this land which, in turn, limits recreational activities. This opinion was mentioned by participants in both group types. Only participants from West Virginia in the pro-surface mining groups mentioned this issue.

> See, we got something that nobody else has. And that used to be open range. Years ago, I already mentioned it, we would get on 4 wheelers, jeeps, motorcycles and everything and ride to the tops of the ridges, go for miles, and just enjoy the breeze and look at the countryside. Oh, it was beautiful… But the trail up behind our house, we leave our house, we go for 5 miles in a straight line. You turn, hit the hill, and go up to the top of the ridge. We start out around the ridge and we can go for miles and miles and there's beautiful land and everything. And the coal [miners] just pass you and they wave at you and you just keep going. Very few places have things like that. It's coming to an end. I can see that.

A participant from the anti-surface mining group in Virginia described her use of common land as a child and the destruction of that common land like this:

> I know they look at us and they say "You don't own that." I don't. It's true. It's where I grew up. It's where I roamed. It's where I went into the mountains to pick berries, it's where I went to the creek to play. There was crawdads, and minnows, and we'd roll up our britchy legs and get down in the creek to scoop them up. You know how you play, "Well, I can catch that one." We would catapult across the water in that creek, get a pole and jump from one side to the other. That's some of the changes on the ground (VA*).

Another talked about how surface mining prevents her from gathering wild plants:

> Everything that I would say here is "coal mining practice destroys not just the land but entire communities and a way of life" because we used to go in the mountains and this is another thing they took away from us. We used to go get herbs, bloodroot, ginseng, all this. They take everything when they go there. They leave nothing. And push it down in our streams, and you can't do none of this now because it's nothing left (Anti-VA*).

A participant from West Virginia describes how the loss of land access limits his ability to collect wild ginseng: "Everyone who goes out ginseng-ing has a compacted area that they have to put more pressure on to try to 'seng and instead of one person 'seng-ing there, you've got 10 so it's depleted that way" (Anti-WV).

Stereotypes and Appalachian Culture/People (8 Quotes, 3 Groups, 6 Participants)

Focus group participants also mentioned how stereotypes about Appalachia affect them: "But across this country the stereotypes of the Appalachian people are pitiful" (Anti-VA). Participants in both group types mentioned the often negative representation of Appalachians.

> I've been to the airport over there many times to pick up a congressman or senator and we'd come through Abingdon and come over here and you'd see those nice, brick homes that the miners lived in, and they'd say, 'Where are these shacks on stilts and so forth?' And I'd say, 'those things left here in the 20's and 30's. They're not here. You're living in a dream.' Well, I'd take them in every pig path in [Southwest Virginia], and at one time over in East Kentucky, and we'd just take them. And it was unusual to find those things that they were looking for. But when they did find it, that's where they took all of their pictures and got all of their information or interviewed all the people. But the people over

> here that were doing very well and progressing, well, they wasn't interested in them. They wanted a story. They didn't really want what was true (Pro-VA).

Members of the anti-surface mining groups made some connections between negative views of Appalachian people and the practice of surface mining:

> There's not many areas of our country that this type of devastation would continue to happen over a period of time like it has here and our area's always been looked upon as uneducated people in the South, the Appalachian people, they're uneducated and we can do them anyway we want to (VA).

Another participant put it this way: "And [surface mining is] just because of the irresponsibility and the total lack of people thinking that we're not worth anything" (WV). A participant in the Virginia group put it perhaps the most poignantly when she asked: "Does anyone care if you're a dying breed?" (Anti-VA*).

Social/Community Wellness

Most of the effects of surface mining on wellness in this area are noted by anti-surface mining group members, though once again this is not always the case.

Community Benefit or Lack of Community Benefit from Coal Money (19 Quotes, 4 Groups, 8 Participants)

Opinions on the community benefit from coal money differed within the pro-surface mining groups. Those in the pro-surface mining Virginia group saw great community benefits from coal revenue: "Of course the economic impact on the community, taxes and so forth, it's just far reaching for the people here." "They've done a lot of development. You can imagine what it would have been like without having these kind of jobs and stuff." "The [coal company

owner] gave 25 million to the college here, and then gave 20 million toward that 30 million convocation center."

A participant from the West Virginia pro-surface mining group also mentioned coal severance tax as an important source of revenue: "There's a coal severance tax. And it comes from the coal mines. And this area is full of coal mines." However, those in the pro-surface mining West Virginia group did not see this money as beneficial to their community:

> But all the coal mines started closing down and everything, and coal severance tax leaves the coal mines and goes down to Charleston. They are supposed to spend it in the communities where it's earned. It doesn't get there. There was some big flack that went off years ago where down in South Charleston they built a park. Nice. And they built it with coal severance tax. Well, there's not a lot of coal mines down in Charleston!

These participants mentioned other amenities built with coal severance tax that they do not have access to: "And the Clay Center. That's coal severance tax. We can't afford to go there."

West Virginia pro-surface mining participants also discussed the lack of overall economic benefit from coal mining in their communities: "The grade school here has about probably 200 kids, probably about a 95% free lunch. Very, very economically depressed area." "And we're on the bottom rung of everything."

Those in the anti-surface mining groups expressed opinions similar to those in the pro-surface mining West Virginia group:

> Well, the UN does one to, the Human Development Index, and it breaks it down later on are you third world country status, first world country status and all. And if you look at all the coal producing areas in the state of KY, they're all listed as like a third world status

(KY).

A participant from Virginia stated:

> …It's important to note that in [this] county between the year 2000 and 2010 we took another increase in household poverty rates from 23.8% in 2000…Full blown 25% of the households in [this] county. Now, that's important, the increase, but it's also important because there was another decrease in population. Which means proportionately it could be even worse (Anti-VA).

Only participants in the pro-surface mining Virginia group mentioned economic prosperity in their communities as a result of revenue generated by coal mining.

Community Discord (17 Quotes, 3 Groups, 8 Participants)

Community discord as a result of surface mining was mentioned frequently by those in the anti-surface mining groups, but only once in a pro-surface mining group. The one time it was mentioned, it was brought up in regard to the way surface mining is conducted differently out west than it is in Central Appalachia. The participant commented that "they don't have as many people against them out west." Those in the anti-surface mining group talked about ways that community discord affects them in their daily lives. One Virginia participant put it simply: "We don't have a sense of community." Others described this discord in more detail. One participant described the behavior of her neighbors at a surface mine hearing: "But at the hearings…we were put out for bait…we were put out for bait by our own. Because there was people sitting in that room that could have testified and they didn't. And they pushed us out there" (VA).

Another described the behavior of others in the community toward her family because of their stand against surface mining: "Like when our wheel came off when we was at the top of the

mountain and at that time all the workers, coal truck drivers and all that was coming through there. Not one offered to stop and help us…You could hear 'em laughing at us and stuff" (KY). A participant from this group also described a common bumper sticker slogan in the area. "Save a coal miner. Shoot a tree hugger" (KY). A participant from the anti-surface mining group in West Virginia described the conflict between her and her neighbors because she opposes surface mining:

> I've had people call me and cuss me out wanting to know why I want to take their job. They're trying to pay their mortgages and my kids and your kids was friends in school, and I used to like your kids. It's mean. It's nasty.

Another participant from the anti-surface mining West Virginia group directly linked coal companies and politicians to the community discord that exists:

> When you have your politicians and your DEP agents and all your agencies, totally on board, one way, with one idea: coal's our friend. We're friends of coal. Manchin with his friends of coal badge right on his shirt standing in front of the podium that says 'friends of coal.' And you try to tell the kids, coal has another side. 'What? You against coal?' Is the first thing they say…'She's an environmental tree hugger. We know who she is.'

Others in this group made similar claims: "Well, they pit us between each other. They try to pit neighbors, even family against family. They go well she's trying to take your job. They'll point to you too!" Similarly:

> And I don't think people realize that because there's just such an incredibly intense propaganda machine that says that if you don't completely support everything about the coal industry then you don't care about this region, that you don't care about anybody

that's from here, that you're against this whole area (Anti-KY).

The mindset of people that leads to this community discord was described this way: "It's this totally black and white blanket-us vs. them" (KY).

Concern for Children/The Future (13 Quotes, 3 Groups, 5 Participants)

This subtheme was addressed, once again, by anti-surface mining participants only. These participants expressed worry and concern about what would happen to the children in surface mining regions in the future. A member of the Virginia group put it this way:

> I've got 3 grandkids that live right below me…I can't stand the thoughts of dying without having done something to try and make it better for them. And to try to stop this total annihilation of our area (VA).

Those from other groups said similar things:

> I've gotten into arguments with people on-line and stuff like that, like that woman saying, 'We're trying to feed our kids.' I'm like, 'Well, I'm trying to make sure that my child can grow up in a healthy environment. I'm trying to look towards the future.' 'Well, the future for us is the next paycheck.' Well, the future for me is my child. When she grows up (KY).

A West Virginian also talked about fighting to create a better future for children: "I'm fighting for my kids' future."

Physical Wellness

The next theme is physical wellness. Participants talked about several different ways that they believe surface mining affects physical health. Differences of opinion between group types existed for some health-related concerns but some similarities between group types also

occurred.

Increased Cancer Rates (22 Quotes, 5 Groups, 14 Participants)

Those in the pro-surface mining Virginia group argued that cancer rates in their area are related to factors other than coal mining; those in the other two pro-surface mining groups saw cancer rates as likely related to surface mining activities. One pro-surface Virginia participant described the problems with cancer in her family and where she believes these problems come from:

> My great, great grandfather he lived here whenever they first started mining, he lived into his 90's. My great grandmother lived here during the most horrible times of mining and she lived to be in her 90's. My grandmother moved away from here whenever she was about my age, and they've kind of come back and forth, but most of the time their life's been spent in Ohio. She's had cancer 3 times, but you know she's also 82, and she had breast cancer. And she spent most of her time in an industrial town in Ohio making anything and everything with all those fumes. I mean it's gosh awful to live up there. Bars on the windows, stinks to high heavens. Mom left, hated it, came back. And my mother's had health issues. But you look at the past, and I don't really think it is a mining issue.

Another pro-surface mining participant from Virginia pointed to the hereditary precipitants of cancer and away from mining activities: “I think it's as much hereditary. Cancers and other things, it's as much hereditary.” Another participant from that group pointed to his family members’ health related behaviors as the cause of illness: “My mother, gosh I don't know, I had mother, three sisters, two brothers all died with cancer. And they smoked and this and that and so forth.”

Those in the pro-surface Kentucky and West Virginia groups believed that there was more of a connection between mining activities and cancer: “All of my family has died with cancer. My mom, my dad, my brother's got it, my sister's got it, my uncle's got it right now all through his body. It has to have something to do with [mining]” (KY). “My nephew at 14 got prostate cancer and they said it was from unsafe water” (KY). “In the holler where we live at, I could name you 10 people that has passed away in the past 7 or 8 years. And I think [surface mining’s] got something to do with it. I really do” (KY). “The incidence of kidney disease and cancers in this area is astronomical compared to other parts of the country” (WV). One West Virginia participant described his viewpoint this way:

> I worked in Michigan and when I got ready to retire, they sent me to retirement class in a room about like this. They had a huge map of the United States on the wall, and they were showing us retirement friendly states. And all through West Virginia and [this] valley there was a big red swath. It was a beautifully colored map. I asked the guy, I said why is [that] Valley red? He said ‘because in the industry, this is known as death valley.’ He said, ‘no industry wants to locate here because of the high cancer rates.’ And there's probably not one of us in this room that don't have a relative that's either died of cancer, or got cancer.

Those in the anti-surface mining groups shared opinions about cancer’s connection to surface mining that were similar to those of the West Virginia and Kentucky pro-surface mining groups: “And then I got lung cancer from it. I had the most of my lung removed” (VA). “My husband had [a specific type of] cancer…There are four within a half mile of my home. Three of those are identical diagnoses. Those should happen about one in 100,000 (VA).

Another participant noted the high rates of cancer in very young children: “We've had two and three year olds with brain cancer. Kidney cancer” (WV).

Health Problems Related to Pollution/Dust (14 Quotes, 4 Groups, 8 Participants)

Only a few pro-surface mining participants mentioned this sub-theme. One member of the pro-surface mining Kentucky group mentioned health problems that he believed were related to mining activity:

> See, I had a situation like that. I had a, I think like a parasite in my system, and I was sick for three or four weeks when I was younger because of bad water. And we lived close to where they were stripping, and I think it had something to do with it.

Those in the anti-surface mining mentioned a number of problems related to water pollution. One participant described an autoimmune condition that she contracted through the consumption of polluted water:

> They told me then that they knew what it was. It was the water because they had all the proof with what I was having that it was the water. Because I did cook with it, we drank it, we bathed in it, everything… He said what had happened was a medication that I was on and the toxins in the water counteracted and that was what was killing me (Anti-WV).

Another participant described having her water tested after her mother began to become ill: “And my mother was getting pretty sick and had the water tested and it just wasn't fit for human consumption. Nobody's was up that hollow” (Anti-WV). One participant from West Virginia described skin problems that her son developed after they moved to a heavily surface mined area:

> My son, he never had no rash on his back until we moved up there, and he don't have no

> rash now since we have the city water. It was while we were using that water. And like I've described before, with water, we may have just bathed in it or whatever, but it can still harm you (Anti-WV).

A participant from Kentucky also talked about skin problems in relationship to polluted water:

> Yeah, there was a layer of gook in there. But when they pulled that pipe up out of that well and the pump, he had on shorts, and that stuff got on his legs and it about ate his legs off… He had a…flesh eating condition. I mean his legs looked awful (Anti-KY).

Several participants from each group type also reported health problems for people in the region because of dust and air pollution. Those who mentioned these problems in both groups linked the health problems to surface mining processes: "It's a problem on my daughter because she's got breathing problems and she's on breathing medicine and inhalers and everything" (Pro-KY).

> It's found in childhood asthma rates, some of the highest in the state…if you took all the childhood asthma cases in this county, you would have filled a single school [with children who have asthma] out of the 6 that we had. Now that's high (Anti-VA).

"Talk about inhalers and stuff. My son never did have breathing problems. We moved up there, his breathing got really bad. Hers did too" (Anti-WV). "I used to [work at a school]…they had to take their little respirators with them at school" (Anti-WV). This was a small but consistent sub-theme with those who mentioned respiratory problems in the area connecting them with surface mining activities.

Intellectual Wellness

Participants did not address intellectual issues very frequently, but one theme did emerge here.

The Nature of Education/Media in Central Appalachia (22 Quotes, 5 Groups, 8 Participants)

Those in the pro-surface mining groups compared surface mining to deep mining in terms of safety. For the most part, the opinion that surface mining is safer than deep mining was expressed: "And a lot of the coal that's being surface mined, it's a different environment. You're not confined so much and you can do a lot of things. .. And surface mining is much safer, in the main, than underground mining" (Pro-VA). "Yeah, surface is safer. It's a lot" (Pro-KY). "I mean there are still a lot of dangers. There are still plenty of ways you can get hurt, but it is safer" (Pro-KY).

Participants did tell some stories about danger on surface mines:

> See, I had another buddy you know, he worked on a strip job. He'd asked them four or five times if they needed to work on the brakes of the truck, and they never did do it. Well, he backed up to the burm, a 150 foot drop, maybe a 200 foot drop, and he couldn't stop. He went over the back of it and it killed him (Pro-KY).

This type of story was infrequent, however, and participants were most likely to report that surface mining is a safer form of mining than underground mining.

Some participants talked about how education is handled within the coal dominated communities of Central Appalachia: "We don't college educate kids. Sacrifice to do that… we don't college educate children to go to work in the coal mines. That's a monoeconomy. That don't happen" (Anti-VA). A pro-surface mining participant expressed similar concerns:

> Not saying anything bad about anybody, but miners, guys that work in the mines all their life, they don't push to have their kids go to school and get a four year degree and open up their world. It truly can open up their world (Pro-KY).

Some expressed concern about the way that those children who do get a good education tend not to return to the area. To this participant, this pattern only benefits the coal industry:

> So we educate them but we have no job for them, and we export the youth, [decreasing] population. Who does that make extremely happy? The coal industry. Because that's less people that they have to deal with. It's less…there's nobody's home to buy, you just left. You're no longer in their way to stop their destruction of your home or your community. (Anti -VA).

Others talked about the difficulty in pushing one's children to get more education when a family not have many resources:

> I don't want my kids to go underground. God knows I don't. If you want to put your kids through college and the coal mines have gone done around here, and you can't work and make good money, your kid's not going to college (Pro-KY).

Some participants talked about their belief that teaching tends to be one-sided in the coal fields because of overwhelming support for the coal industry and how this prevents children from learning to think critically about their world:

> Now, the other part of education is, as a teacher, the thing that you've got to do more than teaching your subject is teaching your kids to think. And there's only one way to do that. It's to give them two sides of things, fully, honestly, and let them present it themselves even and compare and contrast and put it together. It opens up the brain to both sides of

> judgment which is the key element of what's wrong here… So, what happens to the intellectual development when you can't hear two sides of anything? (Anti-WV).

Another participant put it this way: "They teach it in our school systems. They teach how good coal is" (Anti-WV). A participant from the Kentucky anti-surface mining group talked about his belief that the coal industry intentionally works to keep citizens from seeing other perspectives on the issue:

> But my personal opinion on it is that in the past 10 or 15 years, the coal industry has realized that overall this area is on an economic decline in terms of economically minable coal reserves. We're way off from what's able to be produced in Wyoming and Montana in the Coal Powder Basin. We've been going steadily downhill in employment numbers since WWII and now we're going downhill on actual coal production as well, especially compared to the Powder River Basin. So I think the industry knows that this is the last couple of decades probably of economically minable coal. So my personal opinion is that this incredibly intense pro-coal PR campaign is really to try to get every last drop. It's to try to push off any potential influence from the environmental side of things (KY).

A pro-surface mining participant talked about a perceived lack of intellectual freedom in the state of West Virginia:

> We had a, remember the guy we showed how to get in the back way to the strip mine? He was a professor at a University, and I can't tell you which one, I don't remember, but he told us that he did an environmental study through the university, and he was told he could not release it. You cannot release an environmental study if you're a student or someone that's doing a study on the environment in West Virginia.

Summary

Some participants reported primarily beneficial effects of surface mining. This was especially the case for the pro-surface mining Virginia group. Most participants reported problems related to surface mining in some areas of wellness. Many of those both for and against surface mining who participated in this study reported emotional distress, high rates of physical illness, community discord and disruption, and the change or loss of beloved cultural traditions. Participants noted widespread environmental problems related to surface mining and blamed environmental problems for a number of human wellness issues. These issues range from increased stress loads to health problems to solastalgia to fear to acute anxiety. Participants reported problems related to the economic power of the mining industry in the region including the lack of other occupational options, high rates of outmigration, and the one sided media and educational representation of the coal industry. Many participants reported feelings of powerlessness in the face of these issues.

There were some differences between pro and anti-surface mining groups in terms of benefits of or problems with surface mining but there were also many similarities between group types. The pro-surface mining group in Virginia held strongly different opinions in many areas and talked about surface mining and its effects in a much more positive light than did most of the other groups.

CHAPTER 5

DISCUSSION

In this chapter, I revisit the original research questions and examine the results in light of these questions. In order to do this, I review the themes and subthemes that emerged from the data and compare these to the existing research, previous interviews, and documented anecdotal reports from residents (when such previous data exists). After discussing the themes and sub-themes, I present and give an overview of some important areas of attention in some groups that did not meet the criteria for a sub-theme as they were not discussed by those in other groups. Next, I present some issues surrounding the process of participant recruitment, controversy about the study, participants' reaction to me and to the focus groups, and my own reaction to the focus groups. Then, I discuss the implications and explore the limitations of the research results. Finally, I conclude with important areas for further research.

The Research Questions

Surface mining is widely practiced in Central Appalachia and is part of a mining industry that provides many of the few available jobs in the region. These jobs seem to come at a high price, however, as previous research has documented a wide range of environmental problems that are associated with surface mining (Perks, 2009; Reece, 2006). In addition, an emerging body of research documents higher rates of serious health problems, ranging from birth defects to cancer, in heavily surface mined areas. This research suggests that a relationship between these health problems and surface mining exists (Ahern et al., 2011; Hendryx & Ahern, 2008). Despite these environmental and physical health problems, little research has been done that

explores the relationship of surface mining to other aspects of wellness in the region. Two research questions guided this project with the aim to begin to fill the research gap on the effect of surface mining on overall wellness. In this chapter, the themes outlined in Chapter 4 will be used to answer these research questions. They will also be used to connect the results with previous research and to make suggestions for further research that could extend the work done in this project to more fully answer the research questions.

A total of seven themes and 29 subthemes were identified from the six focus groups conducted. Themes follow the basic categories of the wellness wheel that served as the centerpiece of each focus group. Sub-themes were included if they were mentioned by at least 5 participants (15.6%) and across at least 3 groups. Sub-themes were included if they were only mentioned by one group type, and this is noted in the text when it is the case. The data follows the sections of the wellness wheel; therefore, sub-themes are discussed under the section of the wellness wheel where they most logically fit.

Research Question 1: What effect does living in communities directly impacted by surface mining have on the overall wellness of residents?

This question can be answered by taking a look at each component of wellness in turn and then putting the various aspects of wellness together to create a more holistic picture.

Environmental Wellness. A few focus group members, specifically those from the pro-surface mining group in Virginia, asserted that surface mining practices have improved greatly over the years and that coal companies operate in responsible ways, following regulations as a rule. These participants thought it was possible to surface mine in ways that produce very few environmental problems. The majority of participants, however, differed in their viewpoint and

cited prevalent problems that compromise environmental wellness for those living near surface mines.

The most commonly cited problem in this area was water pollution and well loss related to surface mining. These problems have been well-documented in the research literature (Blakeney & Marshall, 2009; McAuley & Kozar, 2006; McQuaid, 2009b; Pond, 2008; Xinchao, Honghong, & Viadero, 2011). Water pollution was mentioned by those in both group types. Participants also lamented forest loss, loss of animal and plant species, problems with dust and air pollution, and problems with landslides. Once again, these problems were mentioned both by those who generally support and those who oppose surface mining. These problems also have been documented in the research literature (US EPA, 2011; Epstein et al., 2011; Hufford, 2009; McQuaid, 2009a; Reece, 2006). Flooding is another documented effect of surface mining (Messinger, 2001; Phillips, 2004). A few participants from the anti-MTR groups mentioned flooding as a problem. Again, participants in the pro-surface mining Virginia group reported many fewer problems in this area than those in other groups and often reported that the industry is doing a good job of handling things like dust and the restoring of forests.

Damage to homes was a negative effect on environmental wellness mentioned by those in both groups. Everything from swimming pools full of dust to roof damage to window damage to foundational problems to complete destruction and total loss of homes was mentioned by participants. Once again, some of these complaints have been made elsewhere in the literature by those who live near surface mining operations (Appalachian Voices, 2011).

Many participants referred to environmental destruction in a more all-encompassing way. People from both "sides" lamented the damage that is done to the natural environment, some of

which they see as irreparable. They compared the damage they see around them to "cancer" "a festering wound" or the surface of the moon. Clearly, many of the participants perceived much overall environmental sickness surrounding them. Much of this environmental destruction was felt in the loss of natural beauty. Participants spoke of the stark contrast between the mountain beauty they could often see facing one way and the destruction they would see when they turned their head the other way. But not all participants saw the effects of surface mining as ugly. An individual in the pro-surface mining Virginia group even compared un-reclaimed surface mines to the Grand Canyon. However, overall, most participants across groups believed that surface mining leads to environmental problems in the region and has many environmentally damaging effects in a variety of areas.

Connected to problems with environmental destruction, participants discussed the extent to which reclamation efforts were successful or unsuccessful in correcting the destruction that many perceive. Those in the pro-surface mining Virginia group were able to cite several successful projects on reclaimed surface mined land. Some of the agricultural projects that they mentioned being done on surface mined land included cattle and hay production, beekeeping, vineyards, orchards, and logging. They also cited industrial projects being built on former surface mines including a prison, a convocation center, an airport, and a community college. Research supports such economic development on surface mined lands elsewhere as well (Zipper & Skousen, 1990; Zipper & Yates, 2009). Those in the other groups did not report the same reclamation efforts in their communities and stated that surface mined land that was poorly reclaimed, if it was reclaimed at all. Research to date suggests that the experience of those in the other groups is a more common experience across the region (Lovan, 2010).

Participants also commented frequently on the support or opposition of mining by the Environmental Protection Agency, President Obama, and the current administration. Those in the pro-surface mining groups tended to see governmental agencies, especially on the federal level, as antagonistic to the coal industry and as responsible for declines in surface mining and in mining overall. Those in the anti-surface mining groups tended to argue that these agencies did not do enough to protect them against the coal industry. One anti-surface mining participant did state that following regulations does produce an economic hardship for the coal industry. There is much controversy over this issue, and this debate was especially intense during the election year in which this research was conducted. The opinions expressed by these group members look very similar to those expressed by supporters and opponents of the coal industry in general (Ward, 2012a, 2012b).

Occupational/Economic Wellness. Although the wellness wheel lists "occupational" as one aspect of wellness, participants' comments in this area reflected broader economic concerns. Therefore, this theme is entitled Occupational/Economic Wellness to reflect the attention participants gave to broader economic issues. Participants from the pro-surface mining groups saw economic wellness as the main benefit of surface mining in the region. In fact, many of these participants saw surface mining, often along with underground mining, as the only thing that keeps their communities from economic death. These viewpoints may represent a harsh reality for the participants as few other employment opportunities or revenue generating industries exist in the heavily coal mined areas of the region (Thompson, Berger, Allen, & Roenker, 2001). Some reported that they were only able to return to the area because they were able to find surface mining work. Despite the reliance of those in the region on coal mining

employment and the faith of these residents in surface mining to improve economic conditions, research consistently shows that the areas in Central Appalachia that are the most heavily mined also have the poorest socioeconomic conditions (Hendryx & Ahern, 2009). In fact, poverty rates are most elevated in areas with high rates of mountaintop removal mining even when compared to areas with high rates of other types of mining (Hendryx, 2011).

Some pro-surface mining participants also saw economic expansion and diversification as a benefit of surface mining. They cited the creation of flat land as an economic opportunity that can be had in few other places. These participants lamented the approximate original contour regulations as an economic impediment that prevents the creation of more flat land. Research supporting the idea of potential economic development on reclaimed surfaced mined land does support this possibility (Zipper & Skousen, 1990; Zipper & Yates, 2009). It is less clear, however, that opportunities for economic development on post surface mined land are being taken advantage of on a regular basis. In fact, in the two most heavily surface mined states, West Virginia and Kentucky, only a small fraction of surface mined acreage overall has been developed for industrial use (Lovan, 2010). For example, a study examining post surface mining land use in West Virginia between 1998 and 2008 found that only 2% of this land was used for industrial/commercial purposes (Quick, 2010). Beliefs in the positive economic traits of surface mining were held with deep conviction by a few participants, but these sentiments represented a minority opinion among the group members overall.

Most participants, especially those in the pro-surface mining groups, seem to believe that coal mining is a virtual monoeconomy in the region and that the survival of other businesses is linked to the health of the coal industry. Researchers have long recognized the economic

dominance of coal in Central Appalachia (Eller, 2008; Lewis & Knipe, 1978). Participants in both the pro-surface mining and anti-surface mining groups talked about the problems that living in an economy dominated by one industry can bring. Among the problems mentioned by the participants were outmigration and population loss when coal production is down, and few other options for employment for those who cannot get a job or do not want to work in the coal industry. These problems are consistently reflected in the research (Lichter, Garratt, Marshall, & Cardella, 2005; Pollard, 2005). Although some in the pro-surface mining groups reported that mining jobs are currently prevalent, this was certainly the minority opinion and several reported that getting a job on a surface mine is particularly difficult. Research supports the latter opinion, indicating that surface mining requires far fewer workers than does underground mining (Burns, 2007; Lovett, 2011; McIlmoil & Hanson, 2010).

Participants in both group types talked about the negative consequences of speaking out against such a powerful industry in any way. Even those who generally supported surface mining and did not want to see it abolished described hardships when they complained about specific aspects of mining near their homes. Participants reported harassment and threats from neighbors and coal company representatives alike when they dared to oppose any aspect of surface mining publically. Others have documented this type of harassment against community members and activists in the region who oppose coal mining practices (Barry, 2011; Gibson, 2006; Gunnoe, 2009; Howard, 2012).

The power of the coal companies also extends to the political sphere, according to anti-surface mining participants. These participants complained of a lack of political voice and political representation as citizens who oppose surface mining. State and local political support

for the coal industry in Central Appalachia is a well-documented phenomenon (Burns, 2007; McQuaid, 2009a; Montrie, 2003). Another problem participants cited that arises from the power of the coal industry is the frequent disregard of surface mining regulations. According to a number of participants, these violations often occur without consequences or carry consequences that mining companies can frequently escape. Those in the pro-surface mining group in Virginia maintained that the coal industry has become much more responsible in recent years and that they follow the letter of the law. No other participants from any other group shared this opinion. Those from the anti-surface mining group in Virginia were some of the most vocal about violations in their area.

Overall, the picture that the participants painted was not one of economic wellness but one of economic subsistence for the region. Most participants on both "sides" of the issue tended to see problems with surface mining as it is currently practiced, but all seemed to realize that there are few other economic resources in Central Appalachia at this time. Those in the Virginia pro-surface mining group did not perceive as many problems with economic wellness in their area as did other groups. Economic issues were a strong focus of the group interviews and seem to connect to multiple other issues of wellness in the region.

Emotional Wellness. Mental health was the original focus of this research study before it was broadened to include other areas of wellness. Several aspects of emotional wellness were mentioned by participants. Significantly, those in the pro-surface mining Virginia group, the group that was consistently the most positive about surface mining, were virtually silent about emotional effects. This may indicate a lack of emotional distress for those who strongly support surface mining and believe it to be a very beneficial thing for the community all around. These

participants were not outstandingly different from other group members in terms of how close they lived to mining operations or their sense of connectedness to the region. Their similarities to the members of other groups also suggest that it may be their perspective on mining that sets them apart. However, a few differences did exist and these may have contributed to divergent emotional experiences of surface mining. Importantly, at least two of the members of this group left the region for work and were able to return only because of increases in surface mining activity. This was not the case for members of any other group. One member of another group had left the region to work, but he had been able to return home only after retirement. Another difference is that, for the most part, members of this group were either retired or held positions that gave them more social power than most other participants could claim in association to their current or previous occupations. This may have mitigated feelings of powerlessness and given these participants a sense of agency that a majority of others in the region do not have. Finally, and perhaps most significantly, there is the possibility that communities in which these participants lived have benefitted greatly from surface mining and have not been significantly negatively affected by it. Or, that the benefits of surface mining outweighed any costs for them. They were able to cite amenities near their community created by coal revenue that those in other groups could not cite. In most cases, members of this group responded differently from others across groups. This issue will be discussed below.

Those from every other focus group did report a variety of emotional effects of living near surface mining. One of the most pervasive emotional effects was powerlessness. Participants in both types of groups reported feelings of powerlessness resulting from the lack of other options for work, repeated unsuccessful attempts to fight surface mining practices, or lack

of political representation. Research on open pit mining in Australia revealed similar feelings of powerlessness in people who lived near this type of mining (Albrecht, 2010; Connor et al., 2004). One participant compared these feelings of powerlessness to "Stockholm syndrome." Another concept developed by Glenn Albrecht may be valuable in understanding the way that many community members feel (2009). This concept is "ecoparalysis." Ecoparalysis is a term describing an emotional state that results when one does not believe that he or she can do anything to make a real difference in response to overwhelming environmental problems. The emotional state that results from this belief often looks like apathy, disengagement, or complacency (Albrecht, 2009).

The way a person perceives his or her ability to cope with stressors has implications for how these stressors are experienced physically and emotionally. Therefore, feelings of powerlessness are very likely to lead to increased stress and problems coping with stress (Boardman, 2008; Cohen et al., 1986; Sapolsky, 1998). However, some participants who openly opposed mining reported some feelings of empowerment even when they were not successful in bringing about the changes they hoped for. This suggests that active work to address the problems associated with surface mining may help to mitigate feelings of powerlessness and, therefore, ameliorate the effects of stress to some degree.

In contrast to the pro-Virginia group, the anti-surface mining group in Virginia seemed to be experiencing intense feelings of powerlessness. Some of these participants had already been displaced by large mountaintop removal mines. Others were living near similar surface mining operations that were in their early stages. This feeling of powerlessness was almost palpable in the room. There was a sense of desperation that I felt and that my research assistant reported

feeling as well. These group members were the most interested of all groups in what we would do with the research results. They also brought us stacks of papers documenting surface mining violations near their homes, photographs of homes they had lost and of boulders in their backyards, and newspaper clippings about the mining activities surrounding them. As both focus groups in Virginia were held in the same day, the stark difference between the two groups was quite apparent. I was struck by the way two groups of people who lived only a few miles apart could view an issue so overwhelmingly differently.

Another emotional implication of surface mining was anger. This emotion was only expressed by members of the anti-MTR groups, but it was a strong thread throughout these groups. Participants reported anger and frustration in relationship to unsuccessful attempts to make changes, to coal mining operators who do not have to live with the effects of their mining, to DEP agents who are perceived to support the well-being of the coal industry instead of the community and to the lack of reclamation done near their homes after mining, among other issues. Some mentioned the chronic nature of this anger and how it "works on you constantly." For many of these participants, especially the females, these feelings of chronic anger were reportedly foreign to them before surface mining began to threaten their homes and families. Anger of community members has been cited in some previous literature about the effects of surface mining (Morello, 2005).

Solastalgia is another problem mentioned by participants and this emotional experience has been associated with similar types of mining in Australia (Albrecht, 2010; Speldewinde, Cook, Davies, & Weinstein, 2009). Grief and sadness connected with landscape change has also begun to be highlighted in literature about surface mining in Central Appalachia, even if it is not

specifically called solastalgia (McQuaid, 2009). Solastalgia was described by members of both pro- and anti-surface mining groups in this study, although the issue was expressed more frequently in the anti-surface mining groups. Participants lamented the changes to their homeland taking place through surface mining and expressed grief and sadness over the loss of the familiar beauty that once surrounded them. One participant described the loss and destruction of his homeland with moans and almost guttural expressions of grief almost every time he described the changes occurring in his place. Feelings of grief and loss were strongly associated with the loss of one's home, with the breakdown of family cohesion, with displacement, and with cultural changes.

In addition to problems with anger, solastalgia, and powerlessness, participants described their experience of both acute and chronic stress. Chronic stress was mostly reported in relationship to ambient stressors. Participants described the stressors of constant noise from trains, trucks, and mining processes. They also discussed the stress associated with constant dust, excessive mud, getting drinking water from plastic jugs after their well water was polluted, and damage to their roads and vehicles because of coal truck traffic. These ambient stressors are consistent with those mentioned previously by residents of mining communities (Barry, 2011; Burns, 2007; Epstein et al., 2011; McQuaid, 2009a; Woods, 2010). Participants also reported acute or traumatic stress reactions for some people, especially in relationship to blasting. Some talked about serious health problems and even deaths that they believed were precipitated by blasting. This aligns with previous literature in that residents have previously stated that living near surface mining operations was like living in a war-zone and have compared the effects of this to "shell shock" (Biggers, 2011; Gunnoe, 2009).

Another emotional wellness issue frequently mentioned was fear. Fear was again related to blasting, but more commonly participants mentioned ongoing fear of slurry pond breaks. Participants referred to the Buffalo Creek Disaster and were well aware of where the impoundment ponds were located in relationship to their homes and what the effects of a slurry pond break would be (Erikson, 1976). The Buffalo Creek Disaster was a massive flood in Logan County, West Virginia in 1972 that was caused by the failure of a huge impoundment pond. This disaster resulted in over 100 deaths and in the destruction of thousands of homes (Erikson, 1976). Worries about slurry pond breaks have been previously cited in some publications (Barry, 2008). Participants also expressed fear in relationship to health concerns, the future of their children, and fly rock. Fly Rock is rock that is propelled from a mining area by explosions created in the blasting process (Hacettepe University Department of Mining Engineering, 1996). Fly rock has caused injuries and deaths to surface mine employees, visitors to these mines, and members of nearby communities (Bajpayee, Verakis, & Lobb, 2003).

Finally, many participants reported struggling with ambivalence about surface mining and the coal industry. They tried to make sense of their family's coal mining heritage in light of the current effects of the coal industry on the landscape. Some struggled with the fact that their pensions as retired miners come from coal mining but that they also disagree with and fight against surface mining. Participants also struggled with the knowledge that families need to support themselves while believing that they have to destroy the mountains to do so, whether or not they like it.

The emotional effects mentioned by participants in these focus groups align with and extend those mentioned by Central Appalachian residents elsewhere (Biggers, 2011; Gunnoe,

2009; Moore, 2005; Reece, 2006) and those associated with similar mining processes in Australia(Albrecht, 2010; Speldewinde, Cook, Davies, & Weinstein, 2009).

Cultural Wellness. Participants talked about the effects living near surface mining has on cultural wellness. Participants in every group clearly stated the importance of place in their lives. This cultural connection to place is a longstanding aspect of Appalachian culture (Behringer & Friedell, 2006; Jones & Brunner, 1994). Most participants had lived in Central Appalachia for most of their lives. Many could trace their family's presence in the region back for generations. Some left for a period to work, only to return at the first possible opportunity. Those directly affected by surface mining often stayed in their beleaguered communities and knew of others who had done the same. When asked why they stayed, the most frequent answer was simply "home." The majority of participants reported having a strong sense of connection to place. This did not differ across group types.

Some participants from both group types talked about the loss of the ability to roam freely, as surface mining limited their access to land that was once used as common grounds even though it was primarily owned by absentee companies. This loss of common ground limited participants' ability to do things they enjoyed such as riding four-wheelers and gathering ginseng. This loss of common ground has been mentioned in previous research (Hufford, 2002, 2009; Reid & Taylor, 2010; Stockman, 2004) and it ties directly into the loss of recreational activities mentioned by participants on both "sides." Participants reported that loss of animal species because of water pollution disrupted their ability to fish and to catch crayfish, that loss of game limited their ability to hunt, that forest destruction prevented ginseng collection, and that soil pollution and fly rock ruined garden plots. The information participants provided has been

reported by other Central Appalachia residents (Blakeney & Marshall, 2009; Foster, 2006; Gunnoe, 2009; Linville, 2006; Lovett, 2011; Reece, 2006). For some, these activities are more than recreational; hunting, gardening, fishing, and collecting ginseng can provide supplemental income or can be an important source of food.

On a more positive note, group members remembered days of coal booms and relative economic prosperity, told stories of family members who mined coal despite injuries and dangers, reflected positively about their own coal mining days, and boasted about the high quality coal Appalachia produces. For many, their ideas of Appalachia and home are inextricably bound together with coal. These feelings of pride were positive in many ways, but they also seemed to add to feelings of ambivalence people reported when they were faced with coal industry practices with which they disagree. This identification with coal may make objective analysis of the industry much more difficult for those living in the region and also likely contributes to the hostility faced by those who point out coal's negative aspects.

Finally, participants talked about the negative stereotypes associated with the Appalachian people. They were aware of the way Appalachians are portrayed in the media and often seen by those in other areas of the country. Those in the anti-surface mining groups associated stereotypes with the power of the coal industry to surface mine coal even if it is harmful to residents, noting that such mining at the expense of citizens would not be tolerated in other areas of the country that are not so stereotyped. Other researchers have noted the connections between stereotypes and radical forms of surface mining (Barry, 2012; Scott, 2009b, 2010).

Community/Social Wellness. Surface mining also affects wellness on a community level. Community discord as a result of differing opinions about surface mining was mentioned by those in anti-surface mining groups. Participants talked about the loss of a sense of community, conflict between neighbors, social rejection of those who support surface mining, and the intentional pitting of community residents against each other by the coal industry. This breakdown of community cohesion in surface mining communities has been previously documented (Bell, 2009; Blakeman, 2013).

Another community wellness issue discussed was the ways in which surface mining communities do or do not benefit from surface mining revenue and severance taxes. Those in the pro-surface mining group of Virginia reported improvements in infrastructure, sanitation, and economic and educational opportunities in their area as a result of money brought into the region by the coal companies. Others reported that coal money does not tend to lead to improvement in their communities. West Virginia pro-surface participants cited high poverty rates in their communities, and parks and cultural centers built with coal money in cities that they cannot afford to frequent. Others reported a lack of economic progress for the majority of people in their communities despite increases in wealth for a few. As stated earlier, surface mining communities continue to have high poverty rates despite coal mining revenues (Hendryx, 2011). In fact, recent research suggests that the coal industry actually costs states more than it contributes in taxes, wages, and other revenue because of expenditures such as the repair of haul roads and the granting of tax credits to the coal industry (McIlmoil, Hansen, Boettner, & Miller, 2010; McIlmoil, Hartz, Hereford, & Hansen, 2012).

As also mentioned in previous publications, surface mining often leads to community loss through displacement (Barry, 2011; Bonds, 2009; Hufford, 2009; Janofsky, 1998). Those in the anti-surface mining groups talked about this problem, as some of them and some of their family members had directly experienced it. According to participants, this led to deep feelings of grief for many of those displaced. One participant even described her mother's continued grief about being away from her home up until the moments of her death.

Finally, many participants in the anti-surface mining groups talked about their concern for the future of their children and the future of their communities. They worried about how environmental destruction, lack of opportunities, and increased rates of illness would affect their children, grandchildren, and the children of the region as a whole. Several reported feeling a strong sense of responsibility to make changes that would make the future brighter for these children. In sum, participants from the pro-surface mining Virginia group saw community benefits of surface mining, but those from other groups saw negative community effects of the practice.

Physical Wellness. As mentioned above, the research literature contains a growing number of studies that document associations between living in surface mining areas and experiencing poor health. Health problems with elevated rates in these areas include: birth defects, low birth weight, kidney problems, lung disorders, skin problems, and cancer (Ahern et al., 2011; Ahern, et al., 2010; Hendryx, et al., 2010; Hendryx & Zullig, 2009). Participants in both group types mentioned concerns about increased rates of some of these problems. Specifically, they complained of frequent cases of cancer in their communities, problems with liver damage, skin disorders, and breathing problems. One participant noted concerns about birth

defects in infants, but this information was not included in the sub-themes because no other participants mentioned it. Although the participants in the pro-surface mining group in Virginia reported cancer diagnoses in themselves, their friends, and family members, these participants did not see cancer as associated with surface mining activities; rather, they believed that cancer is more of a genetic problem or a problem associated with personal health behaviors such as smoking.

Pro-surface mining participants also reported that they believe surface mining is safer for miners than is deep mining. Overall, research indicates that there are more problems with injuries, black lung, and fatalities in underground mines; however, surface mining is also dangerous work (Harris, 1998). Recent deaths and cases of lung disease have resulted from surface mining work (Smith, 2012; Center for Disease Control, 2012). Although some participants mentioned the dangers involved with surface mining, overall these participants saw it as a safer way of mining when it comes to miners' wellness. Overall, the participants' reports about physical wellness mirrored previous research on this topic.

Intellectual Wellness. This topic was less of a focus in the groups, but one theme did emerge. Participants talked about the nature of education in their communities because of the monoeconomic system and the power of the coal industry. Participants on both sides of the issue talked about the lack of encouragement of children to get college degrees by those in the region. For those who do pursue education, participants discussed problems with outmigration, which is a well-documented problem in Central Appalachia (Lichter et al., 2005). They also talked about the problems that arise for families who would like to send their children to college but cannot afford to when "the coal mines have gone down." Low incomes are certainly a practical

deterrent for many of those who desire a college education for themselves or their children or grandchildren.

Another aspect of education in a monoeconomy mentioned was the issue of censorship and the one-sided teaching and media representation of surface mining and of mining in general. One pro-surface mining group member mentioned a case of censorship of research that portrayed coal in a negative light. Aside from this, comments were made by anti-surface mining participants only on the topic of the negative effects of the monoeconomic system on critical thinking. These participants commented on the way schools teach children about "how good coal is," the way teachers and students who express alternative opinions about coal mining are ostracized, the way all the local media seems to be biased toward coal, and the way coal industry propaganda is prevalent. Participants wondered about how these strategies would affect critical thinking skills overall and mentioned the few exceptional teachers they knew who would allow for unbiased discussion of coal mining in their classrooms.

Research Question 2: Do those for and those against MTR perceive the effects of MTR on wellness differently?

This question is difficult to answer. In five of the six groups, the answer is mostly and surprisingly "no." Some clear differences did exist between group types. As far as emotional wellness, pro-surface mining participants did not mention that they experience anger in relationship to surface mining activities. In addition, there were some differences in community effects. Specifically, pro-surface mining participants did not talk about displacement and did not report community discord, presumably because they had not personally experienced these problems. Similarly, they did not mention problems with a lack of political representation as

their local and state representatives are also typically pro-surface mining. Anti-surface mining participants expressed perceptions of the EPA and the Obama administration as not doing enough to regulate coal mining; those in all pro groups expressed the opinion that these agencies were doing too much to regulate mining. Finally, pro-surface mining participants did not express the same worries about the future of the region's children. Aside from these few differences, those who identified as pro-surface mining in these five groups and those who identified as anti-surface mining shared many of the same concerns. Different groups spent more time and expressed more concerns about some issues than others.

As mentioned in the Methods section, participants in the West Virginia pro-surface mining group rated themselves as being more in the middle of the written scale regarding support of surface mining. However, they maintained that they believe that surface mining is a good thing as long as it is done according to regulations, specifically because it creates much needed economic opportunities for residents. Kentucky pro-surface group members expressed very similar perspectives. They did not want surface mining to end; rather, they wanted it to be done "right."

Members of these two groups do not fall into the either-or categories of coal field people so often portrayed by the media. This does not mean, however, that these participants are necessarily a poor representation of Central Appalachians who support surface mining. Of note, the participants in the pro-surface mining Kentucky group softened their criticism of the coal industry significantly when a surface miner walked into the back room of the restaurant where the focus group was being conducted. They agreed with his claims about the benefits and cleanliness of surface mining, only to present their opposition to his arguments after he left the

store about five minutes after he entered it. It may be the case that opinions about surface mining are not so clear as they are often portrayed in the media and that when residents have a safe and neutral place to express their beliefs, these opinions are prone to cover more of the gray area.

The current research suggests that those who oppose surface mining and those who support it in Central Appalachia may not be as different in their viewpoints as is often thought. All of them are facing the same economic problems, problems that have plagued the region for decades. People are, of course, affected by these problems to varying degrees in their personal lives. However, the overall economic picture in the region has many universal implications in terms of community resources, population loss, and educational opportunities.

The group that most clearly stood apart from the others in this study was the pro-surface mining Virginia group. As mentioned above in the section on emotional wellness, these participants were similar to those in the other groups in many ways, but they were also different in some significant ways. Perhaps most importantly, several of these participants had been forced to migrate North to find work and had been able to return to the region when surface mining production increased. These participants expressed gratefulness for the opportunity to return home and seemed to have a strong sense of loyalty to surface mining because it afforded them this chance. In addition, several of the members of this group worked in, or had retired from, positions that gave them some degree of economic security and social power. These participants did not express the same feelings of powerlessness and seemed much more hopeful that surface mining had brought, and was continuing to bring, good things to the region. It may also be the case that in the communities in which these participants lived, the benefits of surface mining outweighed any costs in their perspective. A closer look at the effects of surface mining near the

communities represented by these group members and the communities represented by others might reveal objective differences.

It may be that the almost totally positive perspective on surface mining of the pro-surface mining group from Virginia may be shared less often than is often assumed. If this is the case, then pro-surface mining residents and anti-surface mining residents of Central Appalachia who live close to surface mines may be experiencing very similar wellness concerns. The most consistent difference that I observed between group types in this study is that pro-surface mining participants want continued surface mining that is better regulated and "done right," but anti-surface mining participants want surface mining to end altogether.

Unique Responses not Included in the Themes

Surface Mined Land Can Be Developed for Gainful Use but Approximate Original Contour Requirements Can Prevent Creation of Useful Land (39 Quotes, 2 Groups, 5 Participants)

This was a topic with a large number of quotes but one that was mentioned by only 2 groups so it did not qualify as a true subtheme. The idea that surface mining can also lead to economic health through the creation of flat land for other economic development came across very strongly in the pro-surface mining Virginia group. No other groups mentioned this idea. As they stated: "Right now it allows me to run 60 head of cattle that I wouldn't be able to run because they made, this is the only place in the world that we're making more land." "Well, I mean throughout here, if you drove into town at all, most of that has been stripped, everywhere with Wal-Mart and most of the schools and things are on stripped land." "Our airport." "We have a vineyard here and just like he has a garden and he does a lot of farmer's market stuff, and then

I[know] a couple guys with blueberries on surface mines and that sort of thing, so we grow a whole variety of things." "This college out here—all that, a lot of that area out there was a strip job. That new convocation center, [they] stripped that. They went in there and cleaned it all up, took the coal out, and used it on a 30 million dollar convocation center. It's all that stuff, it's contributory." Pro-surface Virginians could site many economic opportunities that have been created in their area on reclaimed surface mined land. This information provided by the pro-surface mining Virginia group may offer some clues as to why their perspectives varied so greatly from other groups.

Pro-surface mining participants in Virginia and West Virginia asserted that surface mining regulations, specifically the Surface Mining Control and Reclamation Act of 1977 requirement that land be put back to its approximate original contour after surface mining (Zipper, Daniels, & Bell, 1989), stand in the way of economic growth after surface mining operations are complete. One Pro-Virginia participant put it this way:

> To take a mountaintop off and go over here and establish a hollow fill and so forth, I don't mean stop a holler up that's 300 miles long, but you have these that run back into the mountains, into the spurs, and so forth and to fill those up and make more useful land is one of the finest things we could do...but to try to put the material back to its original contour has always been…a joke. It was all promoted by the environmental special interest lobby, and you can't put loose spoil back up against a mountain…Well, that land even though it may be approximate original contour, it's relatively useless.

Similar opinions were expressed by several other group members in Virginia. In West Virginia, pro-surface mining group members echoed the opinions of those in Virginia:

> Traveling through the hills and stuff, if they'd come in to strip mine and leave it flat and level, build a road across it or something and people could use it, it would be great. But they put the contour back, and they plant a couple of trees and they just run off and leave it. And it's just not great.

Approximate original contour reclamation was seen as harmful by some participants because they believe that flat land created by surface mining holds the potential for economic opportunities.

Overall, economic wellness was mentioned much more frequently by those in pro-surface mining groups. Many of those in the pro-surface mining groups cited economic reasons as their main reasons for supporting surface mining. However, all participant groups discussed economic issues in relationship to surface mining.

Pride in Coal Mining Heritage (14 Quotes, 2 Groups, 5 Participants)

Participants talked about the pride they experience in relationship to coal mining. For many, coal is a big part of their cultural heritage. The majority of participants had family members who work in the industry or they worked in the industry themselves. As one pro-surface mining participant from Kentucky stated: "Coal is what we live for here. Everybody that you talk to that's a coal miner will tell you something negative about it, but... they'll also tell you that they love it." Coal mining has become a large part of the identity of many Central Appalachians. "It seems like to me is what [the coal industry has] been able to do is really tie the whole notion of Appalachian identity to coal. It was like they were able to say, we are coal. This is the coal region. We are coal people" (Anti-KY).

Participants on both sides of the issue recognize the hard work that coal mining is and hold a sense of respect for those who have worked in the coal industry, especially in underground mines. “People don't understand what these men give to mine that coal…I've seen these old miners gasp for their last breath because they got black lung” (Anti-WV). One participant talked about the portrayal of coal mining in the media:

> Now you watch these movies about these coal miners. That'll change your outlook on everything. That makes a lot of people respect coal miners more because you can actually see what they go through and what can happen to them at any time you go under that mountain, or on the surface anymore, but when you go under that mountain every day, you don't know if you're coming out or not (Pro-KY).

Another talked about his father-in-law with a sense of pride: “Yeah, her dad got his arm cut off. [He] went back in there and worked [another] 40 years.” This sense of pride likely engenders many positive feelings in the people who experience it.

Displacement

Problems resulting from displacement by surface mining were mentioned by those in the anti-surface mining groups only. One participant from Virginia described the difference between her original home and the home she was given by the coal company when she was forced to move.

> I live on a hillside, and up there I had two big level lots… I'm on the side of a cliff now. Water's coming down, in a double wide trailer, and that house up there… over a hundred years old the house was. It was built out of wormy chestnut and solid oak. Does a trailer ever [compare]? (VA).

Kentucky anti-surface mining participants talked about the difference in their access to resources after most people were displaced from their community:

But now, we used to have a lot of people that lived over there where we live, but there's just us now. There's what, four families? And they bought everybody else out. So it's real isolated and when you live in an isolated area, it's hard to get anything done. I mean we will never get what's considered city water. The expense is too big for them to run the line over in there. We can't hardly get the road worked on. Round about election time you might get the road graded and gravels put on it.

A anti-surface mining participant from West Virginia spoke about how displacement affected her whole family:

> And that's when the whole family got together and they decided, because Hobet kept trying to make them move anyway, that they was going to have to leave. Like I say, they wasn't able to put gallons of water into the washer and stuff, and my mom was real old fashioned. You just didn't go to the Laundromat. That was stupid. You wasted your money and your time and your gas. So anyway, there wasn't enough land for, because my father had 10 brothers and sisters, like I said there was just a lot of nephews and everybody up that holler. There wasn't anywhere for them to move close together, so the family got separated.

Health and Safety of Miners (11 Quotes, 2 Groups, 5 Participants)

Those in the pro-surface mining groups compared surface mining to deep mining in terms of safety. For the most part, the opinion that surface mining is safer than deep mining was expressed. “And a lot of the coal that's being surface mined, it's a different environment. You're

not confined so much and you can do a lot of things. .. And surface mining is much safer, in the main, than underground mining" (Pro-VA). "Yeah, surface is safer. It's a lot" (Pro-KY). "I mean there are still a lot of dangers. There are still plenty of ways you can get hurt, but it is safer" (Pro-KY). Participants did tell some stories about danger on surface mines:

> See, I had another buddy you know, he worked on a strip job. He'd asked them four or five times if they needed to work on the brakes of the truck, and they never did do it. Well, he backed up to the burm, a 150 foot drop, maybe a 200 foot drop, and he couldn't stop. He went over the back of it and it killed him (Pro-KY).

This type of story was infrequent, however, and participants were most likely to report that surface mining is a safer form of mining than underground mining.

Natural Intelligence in Appalachia. Again, the pro-surface mining Virginia group gave attention to a topic not covered in other groups. Those in the pro-surface mining Virginia group mentioned their belief in a high level of intelligence in the people from the region. As one participant stated:

> There's a lot of natural intelligence here. I can remember when I went to college and I was sitting in math class and there was all these kids from Northern Virginia. They were just so smart, and they couldn't do any of it to save their life and it was like, simple for me, and I was not the top student in my class. I know kids that work in the mines now, boys that could have done that stuff in their head. And not even thought about it. And another one that was supposed to be here today that couldn't. He went into engineering at tech, and he could do the stuff in his head.

Another participant from this group highlighted the work that bright men from the area were able to do in the region:

> There's just myriad of young men who have graduated from high school and college and have went on to esteem themselves. Many of them have stayed in this area and have esteemed themselves. They're doing good, useful work and have jobs that help us.

Again, these Virginian's present a more empowered view of their region and of the coal industry.

Stewardship of the Land. Participants did not spend a lot of time on spiritual wellness during the interviews, but one sub-theme emerged from the data. All participants who expressed spiritual notions about land stewardship were from the Virginia groups. Some participants reported feeling a sense of spiritual responsibility to be good stewards of the land. One pro-surface mining participant in Virginia mentioned this need to care for the land. He also mentioned that surface mining was a "Godsend" in the area:

> We need to be environmentally conscious. The Lord give us this land and made us stewards of it. He put us here with it and charged us, but I don't think that the, what we affectionately call the "tree huggers," I don't think they should have it all their way. I think they have a valid point, I think they do, I think sometimes we go astray. And I think it's good to have that input, I really do, to make us aware of that. But I think that surface mining, in this area of Virginia, has been just a Godsend.

Others in the anti-surface mining groups also expressed the need to care for the earth: "It would be foolish for them to deny global warming. We may disagree on the cause and the rate of the global warming, we should all agree that we have a responsibility to take care of the earth."

Some participants expressed confusion or frustration that other religious people did not seem to take up the charge of good stewardship: “And a lot of these people claim they're Christians! They might claim they are, but they ain't!”

The Recruitment and Scheduling Process

Most of the details of the recruitment process are outlined in Chapter 3. However, it is important to revisit the process here to discuss some of the ways the recruitment process may have affected the outcomes of the study. First, recruiting participants from three different states presented its own difficulties. Although I was residing in Virginia at the time of the study, even participants in this state were difficult to access because the heavily surface mined areas of Virginia were about a three to four hour drive from my home. Setting up meeting locations was hard to do at a distance, but key informants were very helpful in this process. Communication was difficult across this distance and, in most cases, I communicated with key informants by e-mail and over the phone but had not met them before the groups were held.

I found that I was not able to garner the cooperation of any community members without an introduction by someone the key informants already knew well and trusted. This was an essential element in recruiting participants as well because participants knew and trusted the key informant who recruited them. I am certain that virtually none of the participants would have engaged in the focus groups without the use of this type of networking. Although this worked well, it could also be seen as a limitation. As an academic and an activist, most of my contacts are also academics and activists. While these colleagues worked hard to connect me with unbiased community members who could serve as key informants, they also had limited connections in the communities in which the research was conducted. Different participant

recruiting methods may have led to different focus group composition which may, in turn, have yielded different results.

In addition, several potential key informants were not able or willing to participate because of difficulty in contacting these participants, their discomfort in speaking out against the coal industry, or their uneasiness in talking about mental health issues. Some key informants were uncomfortable with trying to recruit current miners as they believed it could threaten the miners' job security should their participation become known. Participants in the Kentucky pro-surface mining group in particular were concerned about the nature of the focus group and asked the key informant to be sure that the focus group was "pro-coal." In contrast to the concerns expressed by the Kentucky group members, I was accused by an historian and another academic researcher in West Virginia, whom I contacted as potential key informants, of being biased in the pro-coal direction. They feared I was attempting to take advantage of vulnerable community members in surface mining areas in what they believed was my pursuit of a pro-coal agenda. These issues required me to be patient and flexible, reassuring potential key informants and participants of my sincere interest in the perspective of the residents of coal mining communities, convincing them that safeguards were in place to protect participant confidentiality and anonymity, and clarifying the open nature of the emotional wellness questions that would be asked.

Scheduling also required a good degree of flexibility and willingness to accommodate busy participants, to find some last minute venues for groups when plans fell through, and to arrive on time at some difficult to find rural areas. I did, in fact, arrive late to three of the groups because I got lost. In each case, participants were very gracious and accepted my tardiness with

good humor. This research required flexibility not only from me but from all involved. In the next section, I describe the process of the groups.

The Focus Group Process

Some observations from the groups themselves may also be helpful in understanding the data. The Virginia pro-surface mining group was the first group conducted. I did not make any overnight trips, so in each state I drove about three to four hours to the first group. When there were two groups in one day, I drove up to an hour between groups. So, even with careful planning, I was often late if I got turned around at all. My research assistant and I arrived a few minutes early for this group, and participants began arriving as we were setting up our materials. As one participant walked through the door, he asked "Is this the tree hugger group?" I responded with a comment to the effect of "No, you must have the wrong building," and we all laughed. However, I must admit that I did feel a bit intimidated by this comment and think it set the tone to some degree. I felt certain that participants had a pre-conceived notion of my position on the topic at hand.

Although these participants met us with generally friendly greetings, they did not engage us in much conversation before the group began but talked amongst themselves instead. Once the group began, the participants were quite warm and friendly with us and the focus group process was quite pleasant. It seemed that the group had somewhat of a mission to convince us of the benefits of surface mining. They mentioned several times that they knew we would be talking to others in the region but wanted us to remember that they were telling us the "truth."
While driving to the other group, my research assistant and I discussed the convincing nature of their arguments and our compassion for their positions. As was characteristic of every group,

participants invited us to their homes after the group for food or continued conversation and invited us to come and see the surface mines near their homes. We were not able to accept their offers of hospitality because of time constraints, but I appreciated their friendly manner. They were quite hospitable and gracious, even if they seemed to believe we were on the other "side" of the issue.

The group process in the anti-surface mining group in Virginia was different in many respects. Participants who arrived early engaged us in conversation very quickly. Although we talked some about participants' families or their plans for the day, conversation turned very soon to the topic at hand. Participants wanted to know more about the research, what we were doing and why. They wanted to show us photographs of the mining near their homes or their homes before they were destroyed. They brought newspaper clippings about surface mining that they wanted us to read. They brought stacks of papers containing information about surface mining violations near their homes along with letters they had written to politicians.

This group was much more emotionally charged than the pro-Virginia group. Participants talked over each other as all wanted to be heard and to express their grievances. The group process was much more difficult to manage because of this high level of emotion and it required more direction from me and the research assistant as we encouraged a participant who had been interrupted to finish a thought, asked one participant to hold comments until another was finished, or tried to look at photographs placed in front of us by one participant as we tried to listen to another. This group had a feeling of desperation. Participants wanted to know what we could *do* to help them.

Both my research assistant and I left the group feeling powerless to be able to do anything to help and wishing that we had some kind of immediate relief to offer participants. We were struck by the stark contrast between the processes of the two Virginia groups. One group reported that the industry was responsible and beneficial. The other group reported that the industry was displacing them and destroying the environment around them. One group was full of people who seemed empowered, happy, and optimistic about the future, but the other was full of people who seemed desperate for change, disempowered, and pessimistic about the future. This contrast made for quite an emotional shift for me and my research assistant.

In Kentucky, we arrived late for the pro-surface mining group. The group members were all outside of the store smoking cigarettes and talking when we drove up. The participants made some good-natured jokes about me getting lost and were quite friendly and welcoming. Participants talked about negative effects of surface mining but did not seem to have the same sense of desperation as the participants in the anti-surface mining group in Virginia had. They did, however, share the sense of powerlessness to change the current situation.

This group had to be redirected to talk about surface mining frequently as they had a strong sense of pride in the deep mining work that they and their friends and family had accomplished, and some of the participants seemed to love telling stories about deep mining. Participants from this group, like the others, stayed and talked for a few minutes after the group, invited us over to see surface mines near them, and offered to help with directions to the next place we were headed.

We arrived late to the Kentucky anti-surface mining group held later that afternoon in a nearby town because of problems obtaining the key to the community center in which we were

meeting. Once again, participants greeted our tardiness with good humor. In this group, the sense of powerlessness that seemed evident in the anti-surface mining Virginia group was again present. However, the emotional weather of the group was a little different and seemed to be based more upon grief than upon desperation, as most of the surface mining processes surrounding the community had been completed and the participants hoped no new mining would occur there. Unlike some of the participants in Virginia who still hoped that at least part of their land could be spared, these participants no longer had those hopes.

The groups in West Virginia had to be conducted on two different days because of scheduling difficulties. The anti-surface mining group there was conducted in the garage of the key informant. This group was made up of several participants who had been active in fighting surface mining and several of the participants were connected in some form or another with an activist organization in the state. Group members expressed many of the same emotional experiences as other groups, but they did not seem to be having the same problems with powerlessness as were seen in other groups. Although they were still experiencing the effects of surface mining and did not feel they had accomplished the changes that had been working for, they did believe they had the support they needed from each other. Once again, friendliness, humor, and hospitality characterized the members of this group as they had in all previous groups.

Finally, I conducted the pro-surface mining group in West Virginia. I arrived about 15 minutes late for this group because of a problem with my car en route and because of a problem with the directions. As usual, group members found the humor in the situation and were patient in waiting for my arrival. This group took the longest to fill out the demographic form and

seemed to belabor over the way they marked the scale to indicate their support of surface mining. They made comments aloud about how it harmed the mountains but that people could not survive without it. They discussed it among themselves. They continued to talk about the scale even after they had finished filling out the demographic forms. In fact, we had to reassure a couple of the group members that they would have time to talk about their perspective on the issue more fully before they would even indicate their level of support for surface mining on the form. This sense of ambivalence continued to color the rest of the focus group. Yet, again, participants invited us to come and see the mining near their homes.

Discussion of Participant Feedback

One of the participants from the anti-surface mining West Virginia group stated she thought the results section accurately represented the viewpoints of the people in the group. She said she especially liked the sections on solastalgia and sense of place and saw these sections as especially indicative of how she was feeling. A participant from the anti-surface mining Virginia group gave several more specific comments. She stated: "I am angry about how quick [the pro-surface mining Virginia group members] are to blame us for everything, or at least it seems that way to me." She also stated: "I was shaken by a realization of the detrimental effects one could have if you are pro-surface mining and work there but realize you are destroying something you yourself admire and enjoy. It seems that would be almost masochistic and could make you dislike yourself. It is worrisome to me." This participant also made comments on specific sections of Chapter 4. In response to the pro-surface mining Virginia group's assertion that not much surface mining is done in Virginia as compared to other areas she stated: "I've heard this story line years ago. I didn't hear it from industry. I heard it from the [Virginia Department of

Mines, Minerals, and Energy] inspectors. They would say it's just a little bit in Virginia, now in Kentucky and West Virginia, it's huge. And because that little bit was in your community, it was implied that you should tolerate it." In response to the positive comments about a community college being built on a former surface mine made by pro-surface mining Virginia participants, she stated: "He was mining in the hollow above [my neighbor's] home. The difference—destroy the common man who has little and no power but buy prestige and influence on a college campus. Sad, sad, sad."

Limitations and Directions for Future Research

As already mentioned, probably the biggest limitation to this study was the absence of the voice of those currently working in the mining industry. Without the input of these residents of Central Appalachia, the picture cannot help but be incomplete. Future research on wellness and surface mining should provide enough safety to include the voices of current coal miners in order to provide a more complete picture. It may be necessary to conduct individual interviews with these participants to ensure that safety. However, the voices of some important constituents were left out of the conversation. No current surface or deep miners participated in these focus groups. Retired miners, retired mine inspectors, individuals who used to work for the coal companies in other capacities, those with family members who were miners, and even a former mine owner were represented in the groups, but no one who is currently mining was included. The political climate in the region made the recruitment of currently employed miners much more difficult. It is not outlandish to think that participation in a focus group on surface mining could cost a miner his or her job. For example, last year a miner in Kentucky was charged with disregarding safety standards on the job. This miner reported that his supervisor ordered him to do work that

required breaking safety standards; he reported that he was afraid to refuse because he was afraid he would lose his job if he did so. The accusations against him were made only after he reported violations made by his supervisors that lead to the death of a co-worker (Estep, 2012). There are many other examples of similar situations (Estep, 2011; Harris, 2006). In this kind of environment, one can see how speaking out about coal mining practices for research purposes could lead to job loss or at least the fear of it.

Another issue that could be seen as a limitation to this study is its breadth. The scope of this study was necessarily wide for two reasons. First, the stigma surrounding mental health prevented successful recruiting for a study focused solely on issues of mental health at this time. Second, the study was exploratory in nature; its aim was to establish or further establish the existence of effects of surface mining on wellness rather than to explore any of these effects in depth. Future research will need to probe the various aspect of wellness more deeply as researchers are beginning to do with physical health effects. When specific problems are better understood, efforts to develop treatments for and solutions to these problems will be more effective. In addition, the more research we have about the human effects of surface mining, the more knowledge we can apply to the creation of policy changes to prevent these problems. Further, all focus groups except the pro-surface mining group in Kentucky were quite small. Three of these five groups met the goal of having a minimum of five participants and one fell just short of that goal with only four participants. Small groups have their advantages, but this also means that we could have included up to five or six more participants in most groups and could have therefore heard from as many as 26 additional community members.

Another study limitation, as mentioned above, stems from the limited number and type of contacts that I had access to in order to recruit participants from the region. Most of these contacts were from the academic or activist realms and may, therefore, have connected me with different participants in Central Appalachia than other sources would have. Different recruiting approaches may have, therefore, produced different results.

Finally, the setting for the Kentucky pro-surface mining group was a significant limitation. This setting was not a private one and although only a few non-participants walked into the study area, these interruptions were enough to threaten participant confidentiality and comfort and may have been enough to alter research results in this group. As mentioned previously, participants seemed to soften or change their opinions about mining when a man dressed in a miner's uniform walked into the room. Participants may have shared less than they would have or may have shared different information than they would have had the location been more private.

Despite these limitations, the results of this study offer important insights into the human impacts of surface mining. Although there were some differences between group types, and especially pronounced differences between the pro-surface mining Virginia group and other groups, the overall picture presented in the research results suggests significant effects of surface mining on wellness in most areas of wellness explored. The results of this study, in addition to the reports of community members elsewhere, suggest that more in depth research that leads to solutions in the areas of community and individual wellness as related to surface mining are greatly needed.

Emotional wellness is a problem that has not been given much research attention previously but that has been mentioned at times by residents of surface mining communities (Biggers, 2011; Reece, 2006; Stockman, 2004). The information provided in these focus groups points to problems with solastalgia, anger, powerlessness, chronic stress, and traumatic stress. Problems with emotional wellness are especially concerning as access to mental health care is limited in Central Appalachia (Zhang, et al., 2008). Emotional wellness deserves more research attention. Specifically, research that documents the prevalence of such problems in surface mining regions and the impact of these emotional experiences on the development of mental health disorders, such as major depressive disorder, post-traumatic stress disorder, and other anxiety disorders, is important. Further, the positive effects of surface mining on emotional wellness that may exist, especially for those who support surface mining and those who rely on it for income, should be explored. In addition, research that explores connections between high rates of prescription drug abuse and destruction of the natural environment are needed. Further, almost no research attention has been given to how MTR affects the emotional well-being of children. Anecdotal evidence and interviews with parents of children in heavily surface mined areas suggest that anxiety and fear may be significant problems for children in these areas (Osha, 2010). Research has barely begun to scratch the surface of the effect of MTR on emotional wellness.

Finally, future research on the human effects of MTR in the region should take a closer look at the specific effects of MTR in each community studied and should place special emphasis on determining how community differences lead to different wellness outcomes. Research of this sort may help explain why the Virginia pro-surface mining group was so

different from other groups in this study. It may be that certain amenities or resources in communities help to ameliorate negative effects or serve as buffers to stress. Alternately, other community level differences such as distance from surface mines, the experience of some environmental effects and not others, or the community's degree of isolation may hold very different implications for the well-being of community members. Further, individual differences such as income and employment status, degree of personal loss from surface mining, political affiliation, or degree of social support may soften or increase the impact of surface mining on residents. Future research should explore such factors in more depth so effective changes and solutions can be developed.

Conclusion

The current study indicates that living in close proximity to surface mining does have some potentially devastating effects on the wellness of Central Appalachians. Implications for physical wellness, environmental wellness, community wellness, cultural wellness, and intellectual wellness echo the findings of other studies and/or the complaints and concerns voiced by coal field residents in various arenas such as interviews, documentary films, and compilations of writings of community members (Blakeney & Marshall, 2009; Burns, 2007; Gunnoe, 2009; Hendryx & Ahern, 2008; Perks, 2010; Reece, 2006; Sutherland, Golden, Gilomen, & Rubin, 2010; Stockman, 2004). The results of this study give further credence to the existence of these problems and add to the sense of urgency with which such problems should be addressed.

Emotional wellness is a problem that has not been given much research attention previously but that has been mentioned at times by residents of surface mining communities

(Biggers, 2011; Reece, 2006; Stockman, 2004). The information provided in these focus groups points to problems with solastalgia, anger, chronic stress, and traumatic stress. Problems with emotional wellness are especially concerning as access to mental health care is limited in Central Appalachia (Zhang, et al., 2008). Emotional wellness deserves more research attention. Specifically, research that documents the prevalence of such problems in surface mining regions and the impact of these emotional experiences on the development of mental health disorders, such as major depressive disorder, post-traumatic stress disorder, and other anxiety disorders, is important. Further, the positive effects of surface mining on emotional wellness that may exist, especially for those who support surface mining and those who rely on it for income, should be explored.

Finally, this study points to a sense of pervasive powerlessness in the region that seems to be tied to economic problems or to the power of the economically giant coal industry. Those in the pro-surface mining Virginia group saw many reasons for hope in terms of the potential for surface mining to help lead to economic growth. In future research, it will be important to determine what separates those who feel a sense of hope and power about economic growth and those who do not. Perhaps those in the region who have insight into how a community can grow economically during or after surface mining can share important knowledge with others across the region. Future research that helps to find economic alternatives will also be important. For, according to these participants and to past research, surface mining has not lead to economic growth and prosperity in most of the Central Appalachian region (Hendryx, 2011; Lovan, 2010; McIlmoil, Hansen, Boettner, & Miller, 2010; McIlmoil, Hartz, Hereford, & Hansen, 2012). At some point in time, there will very likely be a coal "bust" without an impending "boom."

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Table 1
Participant Characteristics

	Participant Gender		Average Number of Years Lived in Area	Average Surface Mining Support Rating	Number who were Employed in Mining in the Past	Number with Family Employed in Mining
	Female	Male				
VA Pro	1	4	48.80	1.40	4	5
KY Pro	5	3	24.12	1.88	3	8
WV Pro	1	3	57.50	3.25*	3	4
Total Pro	**7**	**10**	**43.47**	**2.18**	**10**	**17**
VA Anti	2	3	59.40	5	2	4
KY Anti	2	3	39.40	5	4	5
WV Anti	4	1	40	4.80	1	4
Total Anti	**8**	**7**	**46.26**	**4.94**	**7**	**13**
Overall Total	***15***	***17***	***44.87***	***n/a***	***17***	***30***

*

Average Surface Mining Support Rating: 5=Strong Opposition to Surface Mining; 1= Strong Support for Surface Mining

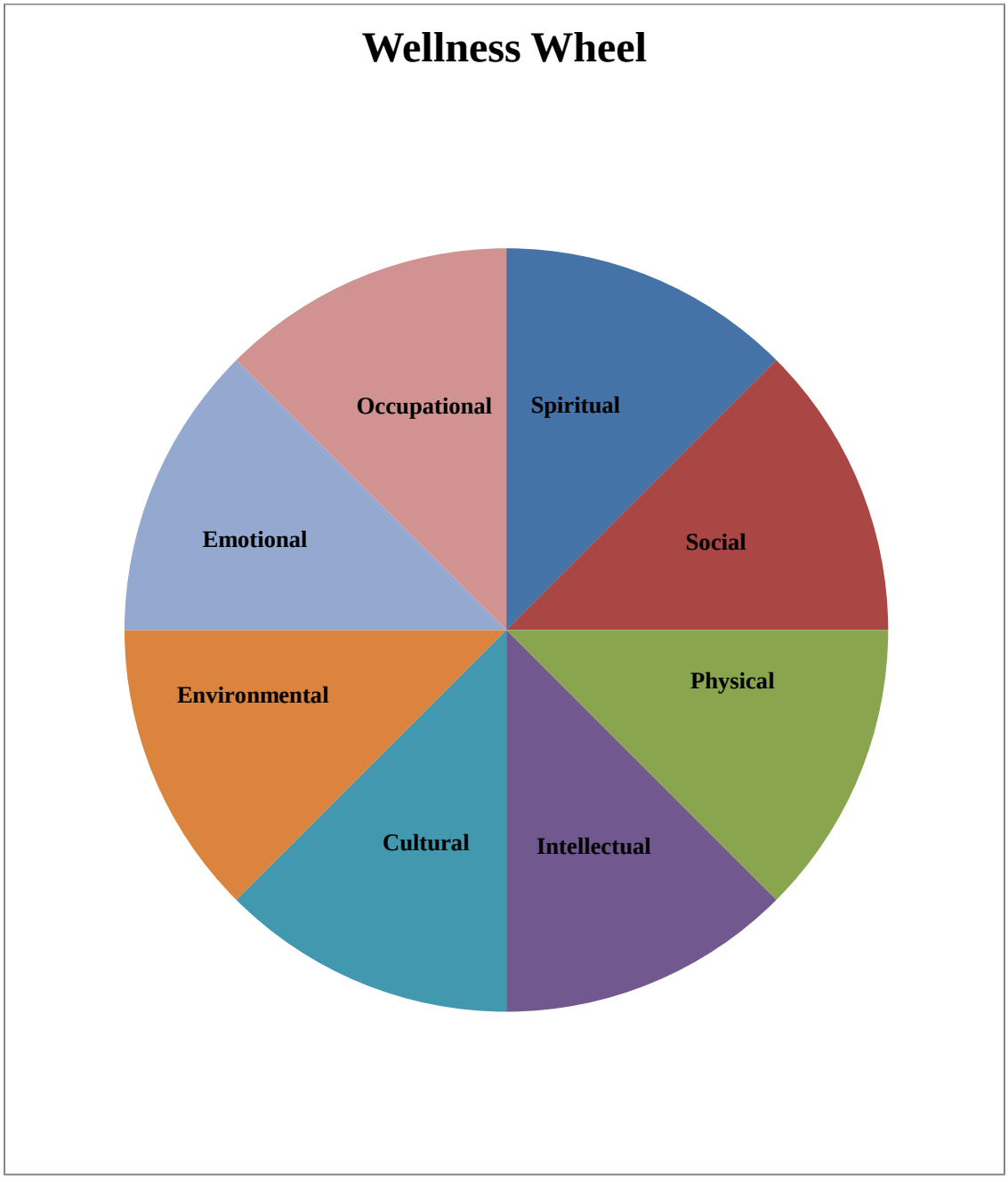
Table 2
List of Themes and Sub-themes

Environmental Wellness
1. Water Pollution/Water Loss
2. Surface Mining Regulations are Followed/Not Followed
3. Environmental Devastation and Loss of Beauty
4. Reclamation (Successful/Not Successful)
5. Dust/Air Pollution
6. Damage to Homes
7. Flooding
8. Loss of Animal/Plant Species
9. Forest Loss/Logging
10. EPA/Politicians/Laws For or Against Coal Industry
11. Landslides
Economic/Occupational Wellness
1. Coal is Economically/Occupationally Crucial in Central Appalachia
2. Those Who Oppose Coal Industry in Any Way Face Harassment and Threats
3. Those Who Oppose Surface Mining Do Not Have Political Representation
Emotional Wellness
1. Ambient Stress
2. Powerlessness
3. Fear/Anxiety/Traumatic Stress
4. Solastalgia/Grief
5. Ambivalence
6. Anger
Cultural Wellness
1. The Importance of Place
2. The Loss of Recreational Activities/Common Grounds
3. Stereotypes and Appalachian Culture/People
Community/Social Wellness
1. Community Benefit or Lack of Benefit from Coal Money
2. Community Discord
3. Concern for Children/The Future
Physical Wellness
1. Increased Cancer Rates
2. Health Problems Related to Pollution/Dust
Intellectual Wellness
The Nature of Education/Media in the Central Appalachian Coalfields

Appendix A

Focus Group Interview Guide

Overall health or wellness is influenced by many factors. Please talk about how living near surface mining affects people in each of the areas listed on the wheel below.



Prompts: How does living near *surface* mining affect people _____? Tell me more about that? What does that mean to you?

Appendix B

Demographic Form

1. What is your sex?

2. What is your race/ethnicity?

3. How long have you lived in the area?

4. How long has your family lived in the area?

5. Do you work in the coal industry?

6. Do you have close family members who work in the coal industry?

7. Please circle the number below that best indicates your general opinion about surface mining.

I strongly support surface mining.		I'm neutral about surface mining.		I strongly oppose surface mining.
1	2	3	4	5

Appendix C

Informed Consent Document

Title of Research: Wellness and Surface Mining in Central Appalachia

Researcher: Ruth Riding-Malon, Paige Cordial, and Zetta Nicely

I am asking you to participate in a research study exploring the effects of surface mining on people who live in communities close to it. If you decide to be in the study, you will be asked to fill out a short demographic form. You will not need to put your name on this form. You will then take part in a group interview about the topic.

The group interview will be audio-recorded and typed later. Your name will not be included in the typed version of the interview and the audio recording will be erased after the interview is typed. If you decide to be in this study, what you tell us will be kept private unless we are required by law to tell. The name of your town will not be used in the typed version of the interviews nor in any publications or presentations about this research. If we present or publish the results of this study, your name will not be linked in any way to what we present or publish.

At the end of the group interview, you will receive a $20 Wal-Mart gift card as a thank you for sharing your knowledge and ideas. If at any time you want to stop being in this study, you may do so without penalty by telling the interviewer. If you decide to be in this study, you may choose not to answer certain questions.

The group interview will give you the opportunity to tell parts of your story and help others to better understand the experiences of those in the region who live near surface mining.

You can expect the group interview to last for about 2 hours total.

Because people tend to have strong opinions about surface mining and because speaking out about surface mining could create conflict between people within a community, there is some risk that participation in this study could cause disagreements between you and other community members. To minimize this risk, separate group interviews are being conducted with community members who support and community members who oppose surface mining. In addition, as stated above, your name and the name of your town will not be used in any publications or presentations about this research.

You should not be in the study if you have any physical or mental illness or weakness that would increase your risk of harm from the study.

If you have questions now about this study, please ask before you agree to take part in the study.

If you have any questions later, or if this study raised some issues that you would like to discuss with a professional, you may talk with Paige Cordial, pcordial@radford.edu, telephone: 540-831-6818 or Dr. Ruth Riding-Malon, rridingmalon@radford.edu, telephone: 540-831-6892.

This study has been approved by the Radford University Institutional Review Board for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject, you should contact Dennis Grady, PhD, Dean, College of Graduate and Professional Programs, Radford University, dgrady4@radford.edu, 1-540-831-7163.

It is your choice whether or not to be in this study. What you choose will not affect any current or future relationship with Radford University.

If all of your questions have been answered and you would like to take part in this study, please tell the researcher that you would like to participate.

I/We have explained the study, have allowed an opportunity for questions, and have answered all of the participant's questions. I/We believe that the participant understands this information.