

FINAL REPORT

**of the Zoning Recommendations of the
Mine Reserve Expansion Study Committee,
an Ad Hoc Committee of the
Clayton County Planning and Zoning Commission**

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(<http://www.claytoncountyiowa.gov/boards-committees/planning-and-zoning-commission.html>).

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A. Introduction

Committee Formation. In Dec 2015, a public hearing was held by the Planning and Zoning (P&Z) Commission to consider requests from the Pattison Sand Co. and 5 petitioners for rezoning of 746 acres to M2 (Heavy Industrial) Zoning in Clayton County, IA. The request was tabled by P&Z to address questions and concerns raised by neighbors. Subsequently, the Community Foundation of Greater Dubuque (CFGD) offered Clayton County a grant agreement to support a Mine Reserve Expansion Study Committee to develop recommendations to address these concerns. In Jan 2016, the Board of Supervisors (BoS) voted to accept this grant agreement. The Zoning Administrator then appointed 5 Study Committee members, 2 from P&Z and 3 from the community.

Pattison Mining Expansion. The history of the mine expansion is illustrated in the map on the last page of this report. Pattison-owned property totals **824 acres**. This is made up of land shown on the map as “already mined/active Pattison” (188 acres) plus “Pattison owned” (636 acres). In 2010, private property of 3 nearby landowners was rezoned to M2 Zoning to permit underground mining on that land. This is shown on the map as Mohning 2010 (383 acres), Hoeffler 2010 (365 acres), and Wille 2010 (470 acres), for a subtotal of 1,218 acres rezoned in 2010 for future mining. In addition, on a portion of the acres rezoned in 2010, mining has already been completed; this portion is the 26 acres on the map identified as “already mined/active Wille.” The 2010 rezoning acreages thus total **1,244 acres**. Then, in 2015, 5 nearby private landowners requested that their lands be rezoned to M2 to permit underground mining. Mine expansion to include these **746 acres** is the subject of this report.

In summary, the grand total of the 3 above groups of properties is **2,814 acres**. This represents the total acreage on which Pattison Sand has already mined or wishes to mine silica sand in Clayton County. (Also shown on the map is land owned by the Consolidated Grain Barge Company [CGB], on which some mining has also occurred.)

Committee Purpose. Sand mining has been studied by other counties in NE Iowa. Mining-specific ordinances have been written, and in one county (Winneshiek), an environmental impact study was conducted and report written. The Clayton County Mine Reserve Expansion Study Committee was given a different purpose by the CFGD. Part of its mission was to “develop recommendations for zoning.” These recommendations, which are the deliverables for the grant agreement, are presented here.

Committee Work Meetings. The Committee began meeting on an every-other-week schedule beginning in early Feb 2016. To date, the Committee has held 12 work meetings, for a total of 35 meeting hours. Agenda and minutes were posted on the P&Z website that is noted on the cover of this report. Attendance averaged 19 visitors/meeting, not including any guest speakers.

During the 7 initial Committee meetings, guest speakers were interviewed. These speakers included (in chronological order): representatives from the Pattison Sand Co., a representative from the Community Foundation of Greater Dubuque, the petitioners who submitted the applications in 2015 for rezoning, the Clayton County Engineer, the Clayton County Attorney and Clayton County Zoning Administrator, representatives from Shawver Well, the DNR State Geologist, and 2 professors from the Univ. of Iowa Dept. of Occupational and Environmental Health.

Beginning with its 4th meeting, the Committee set aside a portion of each meeting for brief, written public comments, which were then read at that meeting. In addition, the grant agreement creating the Committee called for it to hold a public comments hearing at which time recommendations in the Draft Report were presented for comment. These comments were addressed by the Committee at a meeting following the comments hearing, and the present Final Report was developed at that meeting.

Public Comments Meeting. The public comments meeting was attended by 34 visitors plus a number of others who did not sign in. Two hours was allotted for comments. The meeting was facilitated by the Zoning Administrator; rules she proposed for running it were discussed. Rules agreed on were speakers would be limited to 2 minutes/speaking slot, and they were asked to sign up to speak. All persons signing up were given a chance to speak first, then others who wished to speak were invited to do so (none did), then all persons on the initial sign-up list were invited to speak again (and some did) because time permitted. Finally, anyone else attending was invited to speak.

A total of 24 persons spoke, of whom 18 voiced spoke about the Draft Report. Some voiced general support for the entire report, but most gave specific suggestions for clarifying or strengthening some restrictions, or proposed new ones to be considered. One speaker addressed other neighbor concerns, and 5 speakers did not support the Draft Report. They raised objections to the Report in general or the Committee process and/or spoke on other topics. The comments part of the meeting lasted 1 hour and 15 min, ending when no one present had anything more to say.

Committee Recommendations. The process the Committee used to develop its recommendations was first to create a consolidated list of concerns. That list appears in Part C of this Report. Recommendations were then selected beginning at the 8th Committee meeting. For each concern, the Committee voted to either place no condition on that concern, or it selected one or more specific recommendations to address that concern. Following selection, the recommendations were edited by the Allamakee County Zoning Administrator (also a Committee member) to better describe them, then they were reviewed for enforceability by both the Clayton County Attorney and Clayton County Zoning Administrator. The Committee voted a second time on final wording for each recommendation.

These recommendations are conditions or restrictions that the Study Committee recommends be attached to any approval of the 2015 requests. The restrictions (see Part B of this Report) will be considered first by the P&Z, which will make recommendations to the BoS, who will then take final action on the requests for rezoning to M2. If those requests are approved, subsequent applications will be made to the Board of Adjustment (BoA) to request “special exception from the ordinance.” These requests are for the conditional use, which is needed to permit any land rezoned to M2 to be used for underground mining. At that time, the Committee’s restrictions will be reviewed by the BoA.

At its 3 restriction selection meetings, the Committee made 37 motions related to identified concerns, of which 22 created restrictions, and 15 motions placed no restrictions on that concern. During subsequent review and editing, these 22 restrictions were reduced to a total of 16 restrictions that were included in the Draft Report.

At the Committee meeting to determine final wording of recommended restrictions for the Draft Report, voting on these initial 16 restrictions was unanimous. At the final Committee meeting to consider changes in the Draft Report that were suggested at the public comments meeting, all changes put to a vote were adopted, 5 of them unanimously and 5 by majority vote. At this final meeting, one restriction was replaced with wording previously discussed by the Committee, and a new restriction was adopted, leaving a total of 17 final restrictions in this Final Report.

Acknowledgments. The Mine Reserve Expansion Study Committee thanks the Planning and Zoning Commission for tabling the proposed rezone requests in Dec 2015 so that further information to address citizen concerns could be gathered.

The Committee would also like to thank the CFGD for reaching out to Clayton County in Jan 2016. Not only did the CFGD offer the grant agreement that created and funded the work of this Committee, but the Foundation also established its charter – namely, developing zoning recommendations to address the 2015 proposed expansion of the Pattison Sand mine. The Committee appreciates the foresight of the CFGD in wanting to support community engagement around complex community issues.

B. Restrictions Recommended by the Study Committee

Air Quality

Restriction #1: Vent shaft setback, monitoring porthole, and closure

Vent shafts shall be no closer (setback) than 1,500 ft to any adjoining property line, unless the owner of said location agrees to a lesser setback distance. Exhaust vent shafts shall have a portal or other means built to Iowa DNR specifications that will allow for monitoring of exhaust air quality. When air vents/vent shafts are no longer needed, they shall be closed by the mine operator or property owner. In the case of a vertical vent shaft, it shall be permanently closed in the same manner as a water well is plugged. The closures shall be done to protect persons or animals on the property; prevent infiltration by ground water, storm water and other possible sources of contaminants into the mine; and shall return the site to its pre-mining condition.

Reason for motion: The reasons for this motion were:

(1) for setback – to protect landowners and farm animals from noise and nuisance, and to protect the public and the animals from the exhaust fumes coming out of the vent shafts, especially after blasting. Also, vent setback distance takes into account recommendations from Patrick O’Shaughnessy, Univ. of Iowa Dept. of Occupational and Environmental Health.¹

(2) for monitoring – to protect the health and safety of citizens, to determine if additional measures need to be taken to keep exhaust within government regulations, and to follow recommendations from Stuart Schmitz, Iowa Dept. of Public Health.²

and (3) for vent shaft closure – public safety.

Restriction #2: Vent exhaust monitoring

Vent shaft exhausts shall be monitored to make sure the exhaust meets regulation emission limits. The test results from this monitoring shall be sent to the DNR, Bureau of Air Quality, Des Moines, IA. Each vent shaft shall be monitored at its initial use during a blast operation. If the test results are within regulation emission limits, then the monitoring frequency shall remain at once a year during a blast event. If the test results exceed the regulation emission limits, then the monitoring frequency must be changed to every blast occurrence. If the test results exceed the regulation emission limits three times consecutively, then a filter system must be installed to bring the exhaust within regulations. If subsequent test results are within the regulation emission limits three times consecutively, then the monitoring frequency can be changed back to once a year.

Reason for the motion: To protect the citizens from vent exhaust emissions that could be detrimental to health, and to make sure that the vent emissions meet and continue to meet regulation emission limits. Also to follow the recommendation of Stuart Schmitz, Iowa Dept. of Public Health.²

Restriction #3: Truck trailer coverage

To lessen the dispersion of silica sand particles into the atmosphere and along public roads, Pattison Sand/Mine Operator agrees that all truck trailers used for transport of sand must be covered by an appropriate ‘covering system’ that will prevent the loss of any material from the cargo area. This is required whether the trailer is considered to be ‘loaded’ or ‘empty’ and shall apply to owned and contracted trucks or trailers. Pattison Sand/Mine Operator shall refuse to load any truck/trailer that is not compliant with this condition.

Reason for motion: The reason for this motion was to lessen the dispersion of sand from trucks, for the health and safety of the public.

Water and Soil

Restriction #4: Well damage

Pattison Sand/Mine Operator agrees to be responsible for any well damage, including the lowering of the static water level, that can be attributed to mining activity.

Reason for motion: The reason for the motion was to protect landowners within the mining area from incurring damage to their wells as a result of mining.

Restriction #5: Testing of private wells

Pattison Sand/Mine Operator agrees to provide annual well water testing for water wells that are within the proposed rezone area and are located on property adjoining the rezoned area. Adjoining property wells shall include all wells located within ¼ mile of the area expected to be mined within a year. Landowners may collect their own water samples and shall utilize Keystone Labs for the water testing supplies and lab testing. The samples shall be analyzed for all ingredients or compounds sampled for in the April 11, 2016 hydrology assessment conducted by Pattison Sand. In addition, the testing shall include acrylamide and any other chemicals used by Pattison Sand/Mine Operator in the mining operation. At least one year prior to any mining occurring in the rezoned area, Pattison Sand/Mine Operator will contact well owners in or within ¼ mile of the area to be mined within 1 year and will invite/allow well owners to complete a baseline test of their well, if desired by well owners. A copy of this notice shall be given to the County. Pattison Sand/Mine Operator shall be provided a copy of the results of said well test and shall be responsible for the costs of said well testing. Pattison Sand/Mine Operator agrees to address and mitigate any well contaminated by mining activities or as a result of mining activity and shall prepare and submit to the County a plan for well contamination mitigation prior to final approval of the zoning change.

Reason for motion: The reason for the motion was to address the health and safety of neighbors in and near the rezoned area. Also, baseline testing offers a process for such testing to more landowners than those whose wells were originally surveyed/tested in Spring 2016 (as reported in the April 2016 hydrology report). Lastly, acrylamide testing follows a recommendation by Chad Stobbe, Iowa Dept. of Natural Resources.³

Restriction #6: Testing of surface waters for acrylamide

Pattison Sand/Mine Operator agrees to test for acrylamide in any surface water discharge in addition to, and in conjunction with, the testing required as part of the National Pollutant Discharge Elimination (NPDES) permit currently regulated by the Iowa Department of Natural Resources.

Reason for motion: Acrylamide testing follows recommendations by Chad Stobbe, Iowa Dept. of Natural Resources³ and Stuart Schmitz, Iowa Dept. of Public Health.⁴

Noise

Restriction #7: Blasting hours and notification

In the proposed rezone area, Pattison Sand/Mine Operator shall only permit blasting to occur at a time of day that is no earlier than 6:00 AM and no later than 8:00 PM, Central Standard Time. At least three days in advance of blasting, Pattison Sand/Mine Operator shall notify the owners of all property within ¼ mile, of the dates and times that blasting will occur. This notification shall be by regular mail or another method acceptable to the recipient.

Reason for motion: The reasons for this motion were to limit blasting to daytime hours, not subject neighbors to noise or vibration at night, provide notice as a courtesy to neighboring property owners, and be a good neighbor to these landowners.

Roads and Traffic

Restriction #8: Tunnels under the Great River Road

Pattison Sand/Mine Operator shall hire a licensed and bonded/insured engineering firm that will **to** design the mine tunnel(s) to be located under Clayton County right of ways for the Great River Road and will warranty that said tunnels shall not lead to collapse or subsidence of any part of the surface of said right of way. The engineering firm shall inspect and certify that the area has been mined in accordance with the design approved by said engineering firm. Pattison Sand/Mine Operator and engineering firm agree to accept responsibility and indemnify Clayton County for any damages in the right of way caused by or resulting from mining operations.

Reason for motion: The reason for this motion was to make sure that Clayton County taxpayers will not be responsible in the event of any tunnel collapse under the Great River Road.

Land Use

Restriction #9: Land uses permitted under M2 Zoning, and tunnel entrances/exits

Pattison Sand/Mine Operator and Landowners within the proposed rezone area agree that all land use activities in the rezone area shall be limited to sub-surface mining activities only, with the exception of constructing, locating, and maintaining vent shafts. The vent shafts shall not be used as an entrance or exit from/to the underground mining area. No exits or entrances from the surface to the underground mine shall be located in the proposed rezoned area.

Reasons for motion: The reasons for this motion were that it addresses many other concerns such as air quality, aesthetics, etc., and it clarifies that “underground only” includes tunnel exits and entrances. Also, it follows Pattison Sand assurance that all activity will be underground and that nothing other than vent shafts will be above ground and be visible.

Restriction #10: Rezoning application changes

Changes and initialing by petitioners on page 1 of each of the 5 2015 rezone request applications shall be completed, and wording changed at 2 locations on page 3 of the applications (i.e., answers to questions 4 and 6) to match the identical corrected wording on page 1 – namely, “to mine underground. Process, store, and ship silica sand and its by-products, all underground.” These changes shall be completed by the time of the Planning and Zoning Commission meeting at which the rezone requests will be reconsidered.

Reason for motion: The reason for this motion was to follow Clayton County Attorney recommendations that the 2015 rezone request applications be corrected and that wording on pages 1 and 3 regarding use of the proposed rezone area be made consistent. Also, it clarifies what Pattison Sand stated (at the June 8th meeting) that it was in the process of doing. Lastly, it translates repeated assurance from Pattison Sand that all mining in the rezone area will be underground, into legally binding wording in the applications for rezone.

Restriction #11: Tunnel use for storage and disposal

No entity shall store any hazardous materials in the underground mining area other than mining supplies and equipment, or sand or minerals removed from the mine as part of the mining process. The only materials that may be disposed of in the underground mining area are sand or minerals removed from the mine as part of the mining process.

Reason for motion: The reason for this motion was to respond to citizen concerns about what has been stored in tunnels in the past.

Restriction #12: Site inspections, non-compliance, and corrective actions by the Zoning Administrator

Pattison Sand/Mine Operator agrees to allow the Clayton County Zoning Administrator, or his/her representative, access to the property to observe operations or conditions of the mining and processing activities on said property. If, upon inspection, the Zoning Administrator determines that any non-compliance with the Clayton County Zoning Ordinance exists, the Zoning Administrator may issue a corrective action order detailing the non-compliance, the action needed to correct the non-compliance, and the timeframe within which it shall be corrected. Failure by the Conditional Use permit holder to comply with any corrective action order may result in a Stop Work Order or a revocation of the Conditional Use Permit and a discontinuation of all mining and processing activities.

Reason for motion: The reason for this motion was that it gives the Zoning Administrator clearer authority to enforce the County's ordinances.

Environment

Restriction #13: Threatened or endangered species, and archeological features

Pattison Sand/Mine Operator shall hire a consulting firm to perform on-site surveys for threatened or endangered species and archeological features when vent shaft locations and access road locations are determined, prior to any construction or pre-construction activities. If said on-site surveys identify any threatened or endangered species or archeological features, the site shall be photographed and protected by a barrier to prevent damage to the site or species, GPS location recorded, and the vent moved to another location. The survey and documentation evidence (photos/other) shall be filed with the Iowa Department of Natural Resources (for threatened or endangered species), the IA Office of the State Archeologist (for archeological features), and Clayton County.

Reason for motion: The reason was to protect threatened and endangered species and any archeological features.

Restriction #14: Long-term reclamation of mined areas

Pattison Sand/Mine Operator shall hire a landscaping consulting firm doing business in the State of Iowa, to do an on-site survey of the total affected acres of the entire mining site. The consulting firm shall then estimate the cost to reclaim the entire site to the standards required by the Iowa Department of Agriculture and Land Stewardship (IDALS). This reclamation estimate shall also include the cost of removal of any sand piles, contaminated soils, the filling in of any storage pits, the removal of any equipment and railroad lines if necessary, and also the closure of any air vent shafts. The current bond amount, held by IDALS, shall then be deducted from this estimate, and the remainder shall be given to Clayton County as an additional bond amount.

Reason for motion: The Iowa Administrative Code states that "the minimum required bond on each site shall be the greater of \$2,000 per site or \$500 per affected acre on the site. Actual bond shall be based on factors including, but not limited to, size of the site, thickness of overburden, type of mineral extracted, type of mining process, and stockpiling procedures for topsoil, overburden and product."

However, the actual bond for the Pattison mining operation is not being adjusted for the above factors. As a result, the current bond amount is substantially insufficient to cover reclamation of the mine site. The addition of the proposed rezone acres will not only make this situation worse because sand from the new area will be processed and stored at the current mine site, but also the addition of air vent shafts will add to the total area to be reclaimed.⁵

Economics and Values

Restriction #15: Viewshed (aesthetics) of the Great River Road National Scenic Byway

Pattison Sand/Mine Operator agrees that sand mined from the rezoned area shall not be stored in any piles that are visible from the Great River Road.

Reason for motion: The reason for the motion was to address concerns of the Iowa Mississippi River Parkway Commission and the tourist industry, as well as goals and policies in the County's Comprehensive Plan.

Emergencies and Liabilities

Restriction #16: Emergency plan for mine workers and neighbors of the mine

Pattison Sand/Mine Operator agrees that an emergency plan shall be filed with Clayton County and updated on an annual, or more frequent, basis. This plan will include a map of all tunnels that show their location in relation to land parcels above the tunnels, and it will include a list of all chemicals stored on the property and the storage location.

Reason for motion: The reasons for the motion were to help the County to more effectively deal with emergencies, address the health and safety of residents, and provide protection for the community.

Other Topics

Restriction #17: Appeals for variance

The Committee recommends that the Board of Adjustment be given the authority to approve a variance from the conditions established as part of this zoning district change. An appeal for a variance from these conditions may be sought in the same manner as an ordinary variance from ordinance requirements (Sec 6.15-3), shall be subject to the same requirements and procedures established thereunder, and shall be in compliance with Iowa Code Chapter 335.10.

Reason for motion: The reason for the motion was to provide Pattison Sand/Mine Operator with a process that could be used to appeal for hardship due to unforeseen circumstances that may come up later.

References for several motion reasons:

¹ O'Shaughnessy, P (Professor, Univ. of Iowa Dept. of Occupational and Environmental Health) email on setback of vent shafts from property lines, sent 5-11-16. An email exchange on this subject is presented below in its entirety; to save space, queries to Dr. O'Shaughnessy are noted as "Q," and his answers are noted as "A." NOTE: Emphasis (underlining) is added to identify what information in this exchange the Committee chose to use to support its recommendation on vent shaft distance and measurement from property lines.

Q: After your presentation on Apr 28 at our County Study Committee meeting in Elkader, a question from the audience was on "how far silica dust can travel when the wind is blowing. I know it depends on wind velocity, but say 25-30 mph." You replied that vent shafts were a low level source (unlike dust from big smokestacks). You then said "a quarter mile was a possible concern because ? [shafts, the exhaust – I did not get the noun written down correctly] were down low." What is the missing noun here? What did you mean by this reference to a quarter mile being a concern? Were you referring placement of shafts any closer to property lines than a ¼ mile being a possible concern?
A: My guesstimate of a quarter mile comes from experience with dispersion models of low level sources such as swine barns, and from the modeling we have done of a sand mine (as given in my presentation) and a processing plant. Because they do not emit pollutants high in the air, they do not travel downwind very far. I do not recall using the word "concern" in this context. A board member gave an example of evidence that sand dust had traveled 2 miles from its source to which I agreed that it may be possible, but such an event would be very rare. We agreed that a half-mile would be a reasonable, and very conservative, "setback distance" in line with those used to place swine facilities. See the following doc and go to Table 6 on page 176 where the setback to residences for "confinement buildings and

covered formed manure storage structures” ranges from 2,375 to 1,250 ft depending on size. (A half-mile = 2,640 feet). <https://www.legis.iowa.gov/docs/ACO/chapter/04-16-2014.567.65.pdf>

Further considerations to placement would be what Pattison plans to do to minimize the dispersion of dust after it exits the vent. For example, do they plan to use trees around the vent as a wind-break, which would probably be cheap but effective way to minimize dust dispersion and therefore decrease the setback distance? Whether the shaft opening is horizontal to the ground (or better pointing downward) or is angled to eject dust up into the air will also affect how far the dust disperses. My guess is that they have done a dispersion model, which would also be good to look at, to come up with a reasonable setback distance.

Q: Thanks for this detailed answer, but now I have a follow-up question: It sounds like you are recommending that shaft placement (and distance from property lines) follow setback distances used for swine facilities which range from ¼ mile to ½ mile, depending on size of the swine facility. Given this range, are you picking ¼ mile as your recommended setback for the vent shaft placement?

A: I wouldn't say that the shaft placement “follow” setback distances used for swine facilities since they are two separate pollution sources, but that the range for such a setback from ¼ mile to ½ mile is “in line with” (as stated below) or “comparable to” those used for swine facilities with the commonality being that swine barns are low sources like the vents are expected to be. And, given that range, I would consider ¼ mile [1,320 ft] a safe distance and ½ mile [2,640 ft] to be a very protective distance.

² Schmitz, S (State Toxicologist, IA Dept. of Public Health) email on health consultation for Pattison Sand, sent 5-31-16. After discussing several health topics, S. Schmitz ends his report with 2 paragraphs of Conclusions and Recommendations. The one pertinent to dust and silica monitoring appears below. NOTE: Emphasis (underlining) is added to identify what information in this summary the Committee chose to use to support its recommendation on monitoring of vent exhaust.

This health consultation has evaluated the potential for adverse health impacts from exposure to respirable dust and silica and from acrylamide that may be present in the flocculent used in the processes on site. If the amount of airborne dust and silica remain close to the levels during the Apr 2016 sampling event, it can be concluded that adverse respiratory health impact will not be experienced by workers at the mine site and by people living near the mine from inhalation exposure to dust and silica. It is recommended that periodic monitoring of respirable dust and silica be completed to ensure these levels remain below levels that can impact human health. It is also recommended that steps be taken to control the potential from fugitive dust through appropriate dust suppression measures.

³ Stobbe, C (Senior Environmental Specialist, IA Dept. Natural Resources) email on acrylamides, sent 5-11-16. This email is presented in its entirety. NOTE: Emphasis (underlining) is added to identify what information in this summary the Committee chose to use to support its recommendation on acrylamide testing in private wells.

Thank you for the submittal of the attached analytics and chromatographs from Keystone Laboratories, Inc. (Keystone) for the three samples (Toe of dam, South shop basin, Outfall 003) pulled from the Pattison Sand site. I had colleagues from our Contaminated Site section, who routinely review this aspect of chemical analysis, provide their evaluation of the submitted data regarding the presence of acrylamide. They concluded that acrylamide was not detected in the samples analyzed. The absence of peaks where acrylamide should show up on the chromatographs supports this conclusion. This is also in line with the comments provided by Staci Arnold, Keystone Project Manager, in her May 4th email where she states in part, “*I also marked, in red on the baseline, where the Acrylamide peak would be if there was one. Since we did not have any detections, there are no peaks on the 3 chromats for your samples.*”

Keystone was able to run these samples at a low detection level of 5.0 ug/L = 0.005 mg/L, and there was no indication of the presence of acrylamide. For context, it's important to note that: 1) there is no numerical federal maximum contaminant level (MCL) provided for acrylamide, 2) EPA has determined that exposure to acrylamide in drinking water at concentrations of 1.5 mg/L for one day or 0.3 mg/L for 10-days is not expected to cause any adverse effects in a child, and 3) the Drinking Water Equivalent Level (DWEL) set by EPA is 0.07 mg/L, which is defined as “A drinking water lifetime exposure level, assuming 100% exposure from that medium, at which adverse, noncarcinogenic health effects would not be expected to occur.” These recommended health advisories are several orders of magnitude above the detection level at which Keystone was able to run these samples, supporting the conclusion that acrylamide was not present in these samples at harmful concentrations.

Assuming Pattison Sand maintains current operations with regard to flocculant application, and given acrylamide's high biodegradability and subsequent low potential to bioaccumulate, it would be unreasonable to presume that acrylamide would show up in any subsequent groundwater or surface water samples at concentrations exceeding the recommended health advisory levels. To further address ongoing public concern, the DNR requests Pattison Sand continue periodic testing for acrylamide, in addition to the parameters prescribed within the approved beneficial use determination.

⁴ Schmitz S (State Toxicologist, IA Dept. of Public Health) email on health consultation for Pattison Sand, sent 5-31-16. After discussing several health topics, S. Schmitz ends his report with 2 paragraphs of Conclusions and Recommendations. The one pertinent to acrylamide testing appears below. NOTE: Emphasis (underlining) is added to identify what information in this summary the Committee chose to use to support its recommendation on acrylamide testing in surface waters.

In addition, the levels of acrylamide found within surface water runoff during the Sep 2013 and Apr 2016 monitoring events at the site are below detectable laboratory methods and below levels of acrylamide that would pose health impacts to people using this surface water as drinking water. It is recommended that sampling and analysis of surface water runoff at the site for acrylamide be continued to ensure the levels of acrylamide in surface water at the site remain below levels that could adversely impact human health.

⁵ Kozak, S (Mines & Minerals Bur. Chief, Iowa Dept. of Agriculture & Land Stewardship) email on reclamation bond on file for Pattison Sand Company, sent 2-11-16. She states:

Typically, all mining operations in Iowa are bonded at the minimum \$500 per acre amount as required by the Administrative Rules. This is the case for Pattison Sand Co. We do not have the staff to individually set bond amounts at our 1000+ mine sites in Iowa.

C. Consolidated List of Citizens' Questions & Concerns for Silica Sand Mine Expansion

This list was posted on the P&Z website in early Mar 2016.

Air Quality

- Vent hole size, location, and output contents
- Vent exhaust monitoring
- Open storage of sand becoming airborne
- Impact of sand transportation by truck

Water & Soil

- Neighborhood wells
- Groundwater table reduction and/or contamination
- Surface water reduction and/or contamination
- Soil contamination
- Erosion

Noise

- Allowed times for all operations (incl. equipment & truck hauling)
- Noise from truck brakes, mufflers

Road & Traffic

- Impact on all roads used to facilitate mine operation
- Possible bypass route
- Effect of tunnels under the Great River Road

Land use

- Other permitted uses/activities under M-2 (Heavy Industrial) zoning
- Above-ground mining activity
- Future use of land (agriculture?)

Environment

- Threatened or endangered species
- Wildlife habitat
- Long-term reclamation of affected areas

Economics and Values

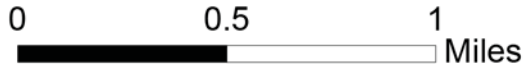
- Economic impact of mining (+ or -)
- Viewshed (aesthetics) of Great River Road National Scenic Byway (sand storage, etc.)
- Viewshed (aesthetics) of the Mississippi River (sand storage, etc.)
- Effect on tourism
- Lowering of values of adjacent properties

Emergencies and Liabilities

- Possibility of sink holes/earthquakes
- Emergency plan for mine workers and neighbors of the mine
- Responsibility for damages to private properties
- Responsibility if a change of ownership occurs

Property Ownership Map Relative to Mining History and 2015 Rezoning Requests Clayton, IA 2016

1,218 acres 2010 Rezoned
 746 acres 2015 Requested
 1,964 acres Total Potential Mining AVERAGE



- 188 Acres Already Mined/Active Pattison
- 636 Acres Pattison Owned
- 86 Acres Inactive Mined CGB
- 161 Acres CGB Owned
- 365 Acres 2010 Hoeffler Rezoned Future Mining
- 383 Acres 2010 Mohning Rezoned Future Mining
- 470 Acres 2010 Wille Rezoned Future Mining
- 746 Acres 2015 Proposed Rezoning Mining Sites
- 26.3 Acres Already Mined/Active Wille

