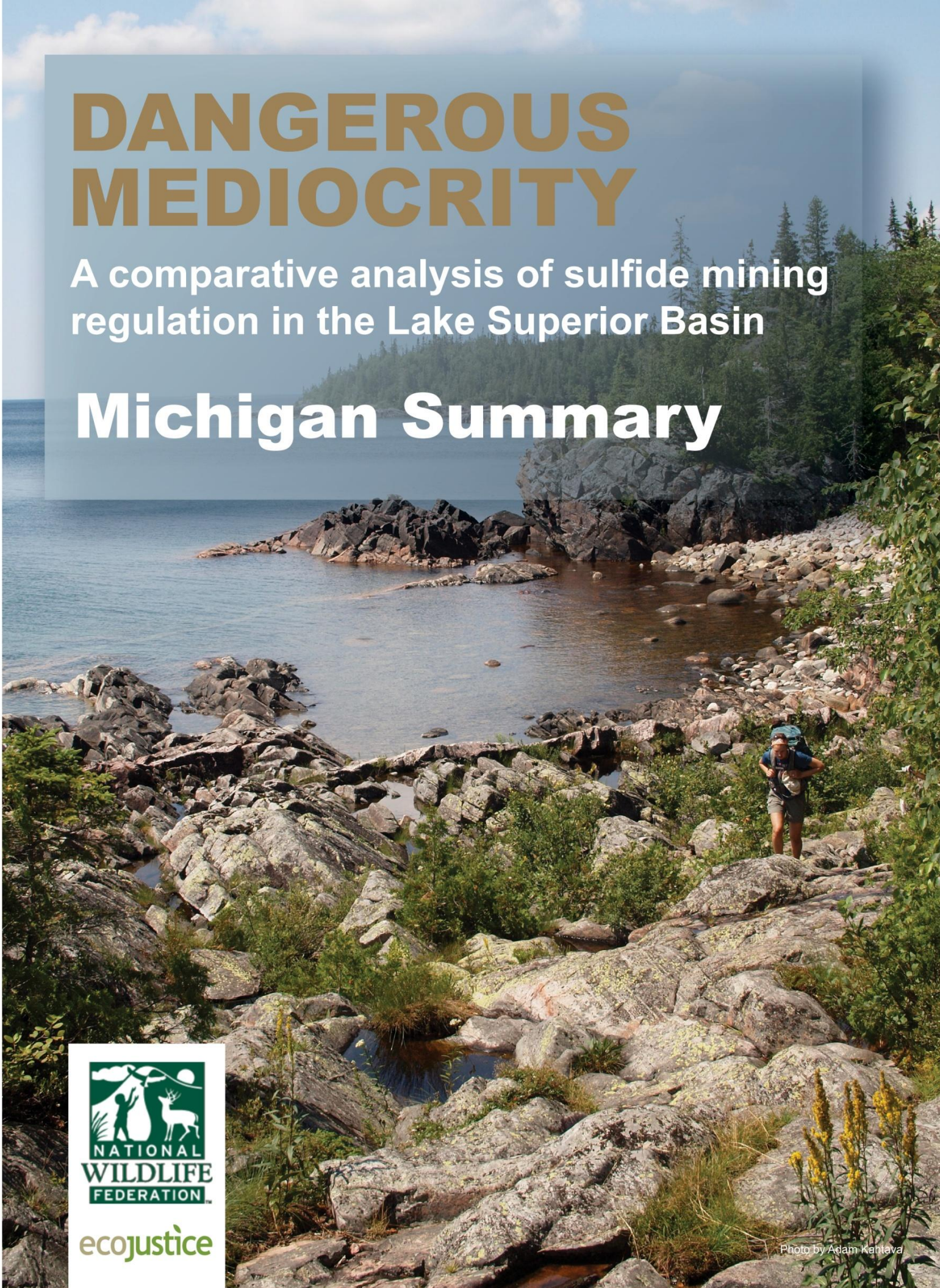
DANGEROUS MEDIOCRITY

A comparative analysis of sulfide mining regulation in the Lake Superior Basin

Michigan Summary



NATIONAL WILDLIFE FEDERATION

ecojustice

Photo by Adam Kantava

The following are excerpts from **Sulfide Mining Regulation in the Great Lakes Region: A Comparative Analysis of Regulation in Michigan, Minnesota, Wisconsin & Ontario**. To read the full report, visit nwf.org/sulfidemining

MICHIGAN

In Michigan, the permitting, operation and reclamation of sulfide mines is regulated primarily by the Department of Environmental Quality ("DEQ") under Part 632 of Michigan's Natural Resources and Environmental Protection Act ("NREPA"), MCL §324.63201 to 324.63223, and its implementing rules, R 425.101 to 425.602. Applicants must submit an environmental assessment, mining plan and reclamation plan to DEQ for review and approval before being granted a permit to mine.

Part 632 was drafted in a collaborative process involving several environmental nonprofit organizations, state regulators, citizens and local government and industry representatives, was enacted by a unanimous vote in both the House and Senate in 2004, and has not yet undergone amendment. Prior to 2004, Michigan regulated iron mining, but had no specific provisions for non-ferrous metallic mining.[1] A desire to effectively regulate the proposed Rio Tinto/Kennecott Mining Company's proposed "Eagle" mine in the Upper Peninsula, and potential other sulfide mining projects, was the impetus behind enactment of the legislation. Part 632 states "[t]he special concerns surrounding nonferrous metallic mineral mining warrant additional regulatory measures beyond those applied to the current iron mining operations." MCL § 324.63202(d). Specifically, the purpose of adding Part 632 was to add safeguards to the existing mining law to prevent acid mine drainage that can occur incident to mining activities involving sulfide deposits:

> Nonferrous metallic sulfide deposits are different from the iron oxide ore deposits currently being mined in Michigan in that the sulfide minerals may react, when exposed to air and water, to form acid rock drainage. If the mineral products and waste materials associated with nonferrous metallic sulfide mining operations are not properly managed and controlled, they can cause significant damage to the environment, impact human health, and degrade the quality of life of the impacted community.

MCL§ 324.63202(c). While recognizing the potential economic significance of sulfide mining to Michigan's economy, the statute states that sulfide mining "shall occur only under conditions that assure that the environment, natural resources, and public health and welfare are adequately protected." MCL §324.63202(e).

To date, Part 632 has been applied through final permitting to only a single project, the Eagle Mine, which is currently under construction.[2] However, litigation and public protests against the Eagle project have cast doubt on the effectiveness of Part 632, its implementing regulations, and the state's permitting agencies. If sufficient safeguards and environmental review are not carried out in accordance with the law, the mine could potentially contaminate a

[1] Part 631 of NREPA applies to ferrous ore mining only.

[2] In February 2012, MDEQ announced preliminary approval and draft permit conditions for the proposed Orvana Copperwood Mine near White Pine, Michigan.

large area, including a protected National Wilderness Area and numerous watersheds including the Huron, Yellow Dog, Dead, Mulligan, and Salmon Trout.[3] At this point, the legal challenge to the Eagle mine's permits is on appeal in state court, but construction continues apace.

SUMMARY OF FINDINGS

The following summarizes the "Assessment" section of the report, providing an overview of each jurisdiction's performance. The information found by this study reveals a number of interesting similarities and differences between the jurisdictions surveyed. A summary table can be found at Appendix B to this report, showing side by side all the criteria scores and overall scores for each jurisdiction.

However, as noted above, their very different practical experiences with sulfide mining regulation make an apples-to-apples comparison impossible. It would not be fair, for example, to assess the experiences of states that have already permitted sulfide mines against states that have no practical experience. It is, therefore, not the intent of this report to rank the jurisdictions against each other, but rather to evaluate each jurisdiction against the set of objective criteria set out in each assessment category. At the same time, it is worth noting any areas where one jurisdiction may provide a model of a regulatory framework or implementation practice for the other jurisdictions. Those suggestions are made in the "Recommendations" section at the end of the report.

Michigan's **regulatory structure** clearly recognizes the distinctive hazards posed by sulfide mining and sets an ambitious remediation goal for any mine permitted under it. The fact that Part 632 was enacted as an entirely new part of NREPA attests to the weight and political importance of this issue in Michigan. The regulations aim to avoid the creation of AMD and set up financial assurance mechanisms to ensure that the permittee will be responsible for any cleanup costs both during operations and even after reclamation is complete. Beyond the lofty goal, however, there is a distinct lack of specificity in setting up standards for review of applications, monitoring, and best-practices for mining operations. There are also a few noticeable holes in the regulatory scope, for instance, there is very limited permitting authority over exploratory activities, no set structure for coordinating the roles and interactions of the various departments and laws involved, and minimal consideration of siting criteria or buffer zones around a mine, or of standards for structural integrity of the mine. Finally, the

[3] Scott Schulz, (2006). "Between a Rock and a Hard Place". *Vermont Journal of Environmental Law* (May 2006), at 16.

environmental impact assessment that is the basis of the state's permitting decision is compiled by the applicant, not independently by the state or a state contractor.

The application **review process** is similarly marked by a lack of detailed standards for evaluating applications. While Michigan has developed an informal way of coordinating application review among various agencies and gives sufficient opportunities for public involvement and notification throughout the application review, it has come under sharp criticism for failing to follow its own regulations and experts' guidance in reviewing a major permit application. There is also very little opportunity given for local governments and tribes affected by a proposed operation to have their concerns addressed in the permitting process.

The law empowers Michigan's DEQ with a good deal of **enforcement** authority, for example to order immediate stops in operations violating any law or permit condition, and to take grievances to the courts for civil or criminal sanctions against a violating mine operator. However, these enforcement mechanisms do not allow much room for public involvement, and the state's permit review process and approval of the Eagle mine has created an atmosphere of public mistrust and suspicion. The law permits, but does not require, DEQ to conduct regular and independent inspections of mine operations or reclamation activities. Whether and how DEQ will utilize its enforcement power during mining or reclamation operations remains to be seen, since the Eagle mine has not yet started operating. Nevertheless, the structure of enforcement authority and DEQ's experience thus far in enforcing the permit review procedures in regard to the Eagle mine indicate that Michigan's enforcement regime may not give a strong enough mandate to effectively regulate a sulfide mining operation.

The **program resources** available for the sulfide mining program are very likely not sufficient to fund the work required by the regulations. The application fee is remarkably low compared to comparable fees in the other jurisdictions, and the financial assurance mechanisms are written in a way that might leave the state paying the bill for an unexpected or catastrophic cleanup.

Finally, Michigan's requirements for **reporting and official statements** are admirable in the total access provided to the public. However, consistent with the general theme throughout Michigan's evaluation, there is a lack of specificity and objectivity in the reporting requirements. Most monitoring is done by the permittee and the state does not have standards in place for evaluating the integrity of that monitoring or for performing its own inspections and monitoring reports.

1. REGULATORY SCOPE

The regulatory scope of a sulfide mining regulation program refers to the breadth and depth of issues and activities regulated by the jurisdiction, and also to the overall purposes and goals of the program. This analysis does not evaluate or account for how the law is actually implemented but simply how it is written; the quality of application and implementation is evaluated in later sections. An ideal program would cover all the major issues of concern (e.g., runoff from tailings, structural stability, financial capacity of the operator, etc.) and also set a robust policy goal for remediation and the greatest degree of environmental protection both during and after mining activities. Fulfillment of the following criteria would indicate a comprehensive system of regulation with an appropriate end goal of the greatest possible protection to the human and natural environment:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.
2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.
3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.
4. Regulations are applicable statewide or province-wide.
5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.
6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.
7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.
8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.
9. Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.
10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.
11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.
12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every medium (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).
13. The state or province requires holistic mine plans, including factors like stability, workers' safety; long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.
14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.
15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.
17. The state or province requires contingency plans for any potential failures.

Michigan's sulfide mining law was established to manage the predicted environmental hazards of environmental mining, focusing especially on AMD. It encompasses most of these hazards, and its overall program goal is written in the strongest possible terms to protect the environment and human health and restore the ecosystem in the post-closure phase. However, the law is relatively weak on setting specific standards that could and should be common to any and all sulfide mines, does not fully account for non-environmental impacts, does not regulate exploratory activities sufficiently, and does not set up a framework for meaningful coordination between different regulatory programs applicable to sulfide mining. Part 632 and its implementing regulations appear to provide a strong foundation and admirable goals for sulfide mine regulation, but there is room for improvement.

Overall grade: Fair.

1	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	SOME
2	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	SOME
3	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	SOME
4	Regulations are applicable statewide or province-wide.	YES
5	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.	SOME
6	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	SOME
7	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	SOME
8	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.	SOME
9	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	YES
10	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.	SOME

11	An environmental review process that uses ecological values and carrying capacity is required and is applied to determine where mining will be allowed.	NO
12	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	SOME
13	The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO
14	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	YES
15	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	SOME
16	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	YES
17	The state or province requires contingency plans for any potential failures.	YES

Discussion:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.

Michigan regulates nearly all of these issues to some extent. This is not an evaluation of how well Michigan regulates these issues, but merely a statement that the state addresses in one way or another the major issues and concerns surrounding sulfide mining.

The production, transport and fate of AMD: These are the primary concerns underlying Michigan's Part 632:

> Nonferrous metallic sulfide deposits are different from the iron oxide ore deposits currently being mined in Michigan in that the sulfide minerals may react, when exposed to air and water, to form acid rock drainage. If the mineral products and waste materials associated with nonferrous metallic sulfide mining operations are not properly managed and controlled, they can cause significant damage to the environment, impact human health, and degrade the quality of life of the impacted community.

MCL § 324.63202(c).

Heap and dump leaching; *waste rock piles and storage*; *tailings basin management*; *particulate contributions to acidic conditions on and off site*: The production and fate of mine waste material is the central focus of Part 632, from the original application through monitoring and remediation phases. An applicant for a sulfide mining permit must submit an environmental impact assessment ("EIA") and a mining, reclamation and environmental protection plan to the Michigan Department of Environmental Quality ("DEQ"). MCL § 324.63205. The mining, reclamation and environmental protection plan must include descriptions and plans for the control of mined materials and any tailings, also including "chemical and physical testing and modeling to predict the potential generation of acid, dissolved metals, and other related substances by reaction and leaching … ." R 425.302(c)(v)(A).

Once operational, the permittee is bound by administrative rules governing the treatment and containment of reactive materials, including:

- stockpiles and storage facilities must have a leak detection system, a leacheate collection system, a composite liner system, a cover, etc., all certified by a registered professional engineer. R 425.409.
- DEQ may permit an alternative method for managing reactive waste if the operator demonstrates such a method is at least as protective as those prescribed, and incorporates at least one of a list of alternative treatment and isolation measures. R 425.409(a)(ii). This rule also covers the permitting and protective requirements for disposal facilities, if used. R 425.409(b).

Transportation of acid-producing materials: Transportation activities are subject to the same review and scrutiny as any other mining activity. The mining, reclamation and environmental protection plan must include "…provisions to prevent the release of contaminants to the environment from ore or waste rock during transportation." R 425.203(c)(xviii) (emphasis added). Further, the rules include "transportation of overburden, waste rock, ore and tailings" in the definition of "mining activity." R 425.103(1)(a)(vi).

Long-term remediation and short and long-term acid production potential in pit and storage areas: Remediation of the mining and waste disposal sites is a central feature of Part 632 and its implementing regulations. The permit applicant's mining, reclamation and environmental protection plan must include "[p]lans and schedules for interim and final reclamation of the mining area following cessation of mining operations" (MCL §324.63205(2)(c)(iii)) and "[p]rovisions for the prevention, control, and monitoring of acid-forming waste products and other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water" (MCL § 324.63205(2)(c)(v)). The baseline for setting the remediation standard is identified in the EIA, which must report on the current and projected (post-mining and cumulative impacts) conditions of all natural and man-made features surrounding the mining area and the affected area. R 425.202.[4]

The mining, reclamation and environmental protection plan must include a description of tailings management, erosion control and stabilization, R 425.203, and a monitoring plan for monitoring both surface and groundwater. R 425.203. An additional section of rules provides

[4] A "mining area" is any area where mining activities take place (MCL § 324.63201(h)), while an "affected area" is any area "outside of the mining area where the land surface, surface water, groundwater, or air resources are determined through an environmental impact assessment to be potentially affected by mining operations within the proposed mining area." MCL §324.63201(b).

further details on standards for ground and surface water monitoring during operations. R 425.406. The applicant's reclamation plan must include sealing, stabilization, revegetation, continued water quality monitoring during the post-closure period. R 425.204. The prescribed endpoint of reclamation is a "self-sustaining ecosystem appropriate for the region that does not require perpetual care following closure […] ecological condition that approximate premining conditions … ." R 425.204(b)(vi).

Siting and Buffering: One area, however, which is not covered explicitly by the statute or rules is siting and buffering. There are no automatically prohibited or "unsuitable" areas off limits to sulfide mining, nor minimum buffer zones prescribed between mining or processing areas and other land uses or property owners. Given the impacts of any sizable mining operation, including unavoidable noise, dust, and associated disturbances, the lack of siting standards is a significant deficiency.

2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.

Structural integrity is considered, but not particularly required, by Michigan's regulations. A sulfide mining permit applicant's mining, reclamation and environmental protection plan must include a plan for "preventing damage to the environment or public health or safety from subsidence, caving, or collapse of underground mine workings." R 425.203(c)(xi). Further sub-sections include a provision to assure that no material damage is done to natural features or to structures not owned by the operator. R 425.302(c)(xi). These rules do not prohibit subsidence or subsidence-producing activities per se, but merely suggest that such subsidence should not cause negative environmental or other impacts. The rules provide no specifics for how to achieve structural integrity or a minimum level of safety. Compared to the treatment by other jurisdictions (see below), this is a barely minimum requirement.

3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.

An ecosystem-based approach is part of the overarching purpose of the nonferrous statute and rules and the EIA process, but does not carry through into the practical regulatory structure of Michigan's program. The overarching theory or purpose of the sulfide mining regulations is to manage the operation and reclaim and remediate the finished site "to achieve a self-sustaining ecosystem appropriate for the region … ." MCL §324.63209(8) and R 425.204(b)(vi). In the application phase, cumulative and additive impacts are analyzed through the EIA process. The applicant's EIA (required under 425.201(1)(c)) must analyze cumulative and additive impacts of the proposed operation on surface and ground water, soil, air, and etc. See R 425.202(2). The EIA must also assess "significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released." Id.

However, there is no requirement or framework set up for a coordinated approach to manage air, water, and other impact issues. Throughout the application, monitoring and reclamation phases, air and water impacts are regulated and monitored within DEQ, which

establishes a mining team for each project including members from different divisions and programs involved in the project's regulation.[5] Yet there is no guarantee or requirement that the different impacts (to air, water, adjacent land, and so on) be managed or evaluated holistically or that the mining team participants actually coordinate their work in any way. In particular, there is no formal connection or communication required between the mining program and the water quality program which administers the Clean Water Act permits. See the Water Quality Report, at Appendix A.

4. Regulations are applicable statewide or province-wide.

There are no geographic exceptions to application of the law or regulations.

5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.

Exploration is not regulated by Part 632 or the associated rules and there is no permitting process for exploration of potential sulfide mines. In certain limited circumstances, exploratory activities may be covered under Part 625 of NREPA, which regulates the drilling of geologic test wells. MCL §324.62506 *et seq*., R 299.2301 *et seq*. Part 625 requires drillers of test wells reaching a certain depth into the groundwater table to file an application and conformance bond with DEQ, and requires DEQ to investigate and inspect the area. MCL §324.62509(2). However, trenching or less intensive geophysical activities are not regulated, and some test wells (e.g. test wells drilled into Precambrian rock, e.g.) are not regulated. See MCL §324.62509(3).

6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.

While Michigan requires a monitoring plan as part of a permit and establishes some clear standards for monitoring parameters, it does not require regular or independent inspections by state regulators and leaves the monitoring plan development and testing largely in the hands of the mine operator. Every mining permit must include a monitoring plan, which is initially proposed by the operator (not independently developed by the state) and which must include "[p]rovisions for the prevention, control, *and monitoring* of acid-forming waste products and other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water." MCL § 324.63205(2)(c)(v) (emphasis added). The mining permit will require the permit-holder to conduct groundwater and surface water monitoring during mining and in the post-closure period. MCL § 324.63209(6).

Additional requirements for the monitoring plan are set in the rules (R 425.203(g)-(h)), as are some monitoring standards. For example, the permittee must notify DEQ and increase monitoring when a solute level reaches 2 standard deviations above background levels. R 425.406. Further, if the permittee detects solute concentrations greater than ½ the level between background levels and the safe drinking water standard or a pH change of greater than .5 units pH for two or more consecutive monitoring events, it must seek the source of the change and

[5] This and other procedures related to application review are outlined in an informal internal DEQ guidance document. Michigan Department of Environmental Quality (2007), "Review and Processing of Nonferrous Metallic Mineral Mining Permit Applications, December 20, 2007". Department of Environmental Quality Policy and Procedures, Number 09-011.

report to DEQ. R 425.406(7)-(8). If the mining activity is deemed to be the source of the solute or pH change, the permittee must implement a response as approved by DEQ. Id.

Every year during operation and in the post-closure period, the permit holder must file an annual report including, "[a] report of monitoring results for the preceding calendar year." MCL §324.63209(6), R425.501. In addition to the annual report, the permit holder must "promptly notify the department and each emergency management coordinator having jurisdiction over the affected area of any incident, act of nature, or exceedance of a permit standard or condition at a mining operation that has created, or may create, a threat to the environment, natural resources, or public health and safety." MCL § 324.63213(2) (emphasis added).

DEQ is not required by any rule, statute or internal procedure to conduct regular monitoring of the operation or site, though DEQ may enter and inspect the mining operation at any reasonable time. R425.408. The major limitation of the above standards is that they are all self-reported and there is no requirement or set of standards for DEQ to evaluate the submissions.

7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.

While the permit application must list all other state and federal permits anticipated to be required, MCL §324.63205(2)(f), there is no requirement for the applicant or permittee to comply with other laws or regulations through the active mining and cleanup periods. The only specific requirement for compliance with all federal and other state laws is that the reclamation plan provide assurance that "[f]inal disposition of all toxic and hazardous wastes, refuse, tailings and other solid waste shall be managed in a manner that protects the environment, natural resources and public health and safety, in conformance with all other applicable federal and state laws and regulations." R 425.204(b)(i) (emphasis added). Further, there is no state requirement that the permittee comply with any applicable tribal regulations.

8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.

A permittee must maintain financial assurance during mining operations until the department determines that all reclamation is complete and through the post-closure (20 year) period, or until the mining permit is terminated for failure to commence mining activities. MCL § 324.63211 ("Financial Assurance") and R 425.301-309 (Part 3 of the Rules: Financial Assurance) cover this. The permit is not effective until financial assurance is established, and if the permittee fails to maintain financial assurance, this is a violation of the permit. Rule 425.301(1). The financial assurance must be "sufficient to cover the cost to administer, and to hire a third party to implement, reclamation under the mining, reclamation , and environmental protection plan as well as necessary environmental protection measures, including remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit." §324.63211(2). The second clause ("as well as…") could cover any "worst-case scenario" situations, i.e. contamination beyond what was expected and planned for in the original reclamation plan.

The amount of financial assurance required by the state is based on the applicant's submission of projected costs that would cover its planned remediation, reclamation, and post-closure monitoring activities. R 425.301(2)(a). MDEQ may hire external consultants to assist in evaluating the applicant's estimate, but is not required to do so. The permittee must update this

calculation every three years. R 425.308. The department may require additional financial assurance (beyond the amount calculated by the permittee) to cover any other activities or costs that it believes may be incurred above and beyond the planned reclamation, remediation and monitoring. R 425.301(2)(b).

9. Financial assurance requirements reach beyond the term of the permit to encompass long-term water treatment needs, etc.

The financial assurance requirements end only when the post-closure period is over, which is when the department determines there is no significant potential for water contamination resulting from the mining operation. MCL §§ 324.63211, 324.63209(6).

10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

The many aspects and impacts of sulfide mining may be covered by different regulatory regimes, but whether and how they are coordinated is not clear. Sulfide mining operations are not exempt from air or water quality laws, endangered species protections, or any other environmental law or regulations. The project team assembled to manage and oversee a project is composed of representatives from all involved departments/programs. However, as noted above, there is no mechanism for systematic coordination between the programs and regulations, and it remains to be seen whether and how they will in fact operate in managing an active mine.

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.

While siting is not directly addressed in Part 632 or its implementing rules, a poor EIA could result in re-siting. The EIA must include a description of baseline conditions, i.e. "the natural and human-made features, including, but not limited to, flora, fauna, hydrology, geology, and geochemistry, and baseline conditions in the proposed mining area and the affected area … ." MCL § 324.63205(2)(b). The rules set forth an exhaustive list of conditions that must be catalogued in the EIA. R 425.202. According to the rules, the DEQ cannot approve a permit to mine unless the proposed operation "will not pollute, impair, or destroy the air, water or other natural resources or the public trust in those resources … ." R 425.301(7)(b). Re-siting is a reasonable alternative to denying or cancelling a project application.

It is important to remember, however that the EIA is prepared by the applicant, not by DEQ, which is considered a red flag by many experts and environmentalists. Finally, "carrying capacity," or any like term, is not used in the statute or rules in the context of EIA (pre-permitting) review.

12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).

Numeric standards for contaminants in all media will be set on a project-specific basis, but there are no specific baseline standards set for sulfide mining contaminants. As a baseline (in the absence of more stringent state standards), federal standards for air and water quality apply

equally in all states; there are no federal exceptions for sulfide mining. For water quality standards, see the Water Quality Report, at Appendix A.

Water quality standards are based on background conditions at the project site. The antidegradation standard (R 323.1098) for water quality applies to any activity "anticipated to result in a new or increased loading of pollutants by any source to surface waters of the state and for which independent regulatory authority exists requiring compliance with water quality standards." Rule 406 sets water quality monitoring standards, but these are all based on site-specific conditions, not absolutes. There are no special or specific numeric standards applicable to sulfide mining.

13. The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

Michigan's law in this area excludes most non-environmental impacts. The requirements for the mining plan are focused on environmental impacts and plans for prevention, control and remediation of adverse environmental impacts, not social or economic impacts. However, the mining plan must establish at least the expected life of the mine (R425.203(a)), number of employees and timing of employment over the life of the mine (R425.203(b)), and a plan to prevent damage to public health/safety from subsidence/caving, including potential effects on drinking water, and natural features and structures not owned by the applicant (R 425.203(c)(xi)).

The rules do not specify or explicitly require stability, workers' safety, long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant, or community priorities as expressed in local planning. These may be required in addition by local governments or other state agencies (e.g. worker safety) but are not part of the state mine permitting requirements.

14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.

This is precisely the language used by Part 632's reclamation plan requirement: The endpoint of reclamation is to be a "self-sustaining ecosystem appropriate for the region that does not require perpetual care following closure […] ecological condition that approximate premining conditions … ." R 425.204(b)(vi).

15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

All environmental impacts are, in theory, evaluated through the EIA, which is the foundation of the permit application process. However, the scope of the EIA does not necessarily include financial or social impacts; it covers only environmental impacts. See MCL § 324.63205(2)(b), R 425.202.

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.

The EIA must include an analysis of potential cumulative impacts "in the mining area and the affected area from all proposed mining activities and through all processes or

mechanisms." R 425.202(b). Beneficiation and transportation are included in the Rules' definition of "mining activity". R 425.103(a).

17. The state or province requires contingency plans for any potential failures.

A contingency plan is required of all mining permit applicants. MCL §324.63205.2(d), R 425.201(1)(e), R425.205. The applicant must assess the risk to the environment or public health and safety of accidents or failures involving a list of potential hazards, and set the response protocol for each. R 425.205(1)(a). The contingency plan must also set an emergency response and notification system, including procedures for notifying the public, local authorities and safety agencies, a list of contacts within the company and emergency services, and a plan for testing the contingency plan to assure its effectiveness. R 425.205(1)(b)-(d). The plan must be sent to each emergency management coordinator with jurisdiction over the affected area. R425.205(2). Finally, the rules require immediate reporting of any accident or incident (to the agency and local emergency and government authorities), and a detailed written incident report to the agency to be filed within 10 days of any occurrence. R 425.503.

2. REVIEW PROCESS

Since each jurisdiction surveyed prohibits mining or related activities without a state-issued permit, with the sole exception of Ontario, the process of reviewing an application for a mining permit is a critical part of the states' regulatory scheme. The application stage is a jurisdiction's best opportunity to control a sulfide mine by setting the parameters of the operation's location, technologies, monitoring requirements, and so on, or by denying an application that fails to meet the state's safety requirements. An ideal application review process is highly detailed, independent, and public. There are a number of factors the jurisdiction can require of a proposed mine that will decrease the likelihood of environmental damage and ensure that the mine operator/owner is providing a net positive value to the jurisdiction. The jurisdiction should apply clear standards to each application, and should have the resources (financial and expert) to conduct a thorough and competent review. It is also important that the application review process be open to the public and that special care be taken to respond meaningfully to the concerns of any local governments or tribes whose interests are directly affected by the proposed mine. These standards and expectations are set forth in the following criteria:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.
2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.
3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.
4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.
5. Consent by any impacted tribe/First Nation is required for mine approval.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI "Prove it first" law).
7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.
8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.
9. The state or province denies permits if they do not meet the regulatory standards.
10. All state or province analytical materials and data are available to the public.
11. The state or province requires that all data supporting an application be available to the public.
12. The state or province supplements applicant-provided data with its own, independently-gathered data.
13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.
14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.
15. Public funds may not be committed to financing or assisting project development until environmental review is completed.
16. Financial assurance is calculated transparently and well-before any permit is issued.
17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Michigan's regulations do not require a highly technical, detailed, or independent review of mining applications. To the extent that the law mandates a comprehensive analysis of the applicant's submissions, the DEQ has been sharply criticized for falling short of that mandate in its review of the Kennecott Eagle project. Specifically, the state's ability and willingness to cooperate with and integrate public concerns has been called into question.

Overall grade: Poor

1	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	NO
2	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	NO
3	The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	SOME
4	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	NO
5	Consent by any impacted tribe/First Nation is required for mine approval.	NO
6	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI "Prove it first" law).	NO

7	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	YES
8	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO
9	The state or province denies permits if they do not meet the regulatory standards.	NO
10	All state or province analytical materials and data are available to the public.	SOME
11	The state or province requires that all data supporting an application be available to the public.	YES
12	The state or province supplements applicant-provided data with its own, independently-gathered data.	SOME
13	Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO
14	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	SOME
15	Public funds may not be committed to financing or assisting project development until environmental review is completed.	NO
16	Financial assurance is calculated transparently and well-before any permit is issued.	YES
17	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	NO

Discussion:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.

The application for a mining permit must include materials describing the potential impacts, mine design and plan of operation and reclamation. MCL §324.63205(2)(b)-(f). These materials, however, are described quite generally and lack technical requirements and minimum standards (as are found, for example, in Minnesota's and Wisconsin's laws). Further, the statute places on the applicant the "burden of establishing" that the proposed plan will "reasonably minimize" environmental impacts. MCL §324.63205(3). This is a highly subjective and broadly written standard, and gives no guidance on what may or may not be "reasonable" or "minimized."

In practice, there is reason to doubt whether DEQ is actually requiring sufficient data from applicants. In reviewing the Kennecott Eagle project application, DEQ staff reports that it did request and require additional information, including a supplemental EIS from the applicant in order to have sufficient data to evaluate the application. Challengers to the application, on the other hand, have reported and alleged that DEQ has not required sufficient data and the application from Kennecott does not fulfill the statutory directive cited above. This statute could be improved by being made more specific. For example, instead of requiring simply a "description of the materials, methods and techniques that will be used," the state could specify all the aspects of the operation it was interested in, as is done in Wisconsin's regulation (NR 132.07). This would take the discretion away from the DEQ and clarify for all concerned exactly what is required.

2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.

There is little to no meaningful cooperation with tribes, and coordination with federal authorities is ad hoc.[6]

Tribal government coordination: If a proposed operation is located on a reservation, the tribe will have primary jurisdiction, but if on ceded territory, tribes will in theory be "consulted" on a proposal – a one-on-one meeting to hear any tribal concerns. The law requires notification to tribes at each step in the permitting process in the same way as notification is given to local units of government. For example, R 425.201(4)(c) requires the state to give notice of a permit application "to all affected federally recognized Indian tribes in this state."

In practice, however, the state has so far not adequately managed tribal concerns in sulfide mine permitting. For example, the Keweenaw Bay Indian Community (KBIC) has vehemently opposed the Eagle mine project, because the proposed operations will cut off access to tribal hunting and fishing areas and destroy a site sacred to the Ojibwa people, the Eagle Rock. Under the current plan, Eagle Rock will literally be demolished at least in part by the operation. KBIC's opposition and litigation to stop the mine have so far proven unsuccessful. Another tribal group, the Ho Chunk nation, petitioned the federal EPA in late 2011 to stop the project, also based on the sacred nature of Eagle Rock.[7] The Ho Chunk nation was never consulted by a regulatory body regarding the project application.

Federal: Some issues are under direct federal authority (e.g. underground injection) while in other areas the state exercises delegated authority (e.g. point source discharge permitting under CWA). The type of coordination depends on what issue is at stake. Generally, there are no formal mechanisms for coordination, but it is ad hoc and as-needed. The rules require applicants to list all other state and federal permits that will be required by the proposed operation, and DEQ's internal guidance suggests that applicants must also have obtained such permits before the mining permit will be effective.[8]

3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.

The mining team set up to evaluate the application will include personnel from whatever agencies are needed, based on expertise.[9] This process is not set by statute, but is at least formalized in a highly detailed internal DEQ guidance document, so the process should be systematic among all applications. Whether or not this process is influenced by political pressure cannot be judged without more experience in dealing with applications.

4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.

The main avenue for public participation is during application assessment and permitting. During the enforcement stage, the public can make a complaint and DEQ must make a record of the allegation, investigate and within 15 days of completing its investigation provide a written

---

[6] The Copperwood Mine has applied for at least two federal permits; MDEQ issued its draft approval and permit conditions prior to any federal decisions being made.

[7] Full text of this letter is available online at http://takingastandfortheland.files.wordpress.com/2011/09/ho-chunk-letter-re-eagle-rock.doc. Accessed December 28, 2011.

[8] See DEQ guidance document, supra note 23, at 2.

[9] Id.

report to the permittee and the person making the complaint. There is no official procedure for public involvement in monitoring activities, though nothing precludes it, except potentially the objection of the landowner. Official complaints from the public would result in an investigation and field report, which would be a matter of public record.

Beyond these official procedures and allowances, DEQ's relationship with concerned citizens, environmental groups, and Tribal leaders in review of the proposed Eagle project has been extremely contentious, resulting in complex ongoing litigation opposing DEQ's approval of the mine application. In the summer of 2011, environmental groups directly petitioned the state Attorney General to seek enforcement actions against alleged DEQ incompetence and fraud, based on the argument that DEQ had "willfully ignored" evidence put forth by the opposition and failed to enforce the law as written in reviewing the permit application.[10] The legal requirements for public participation may be as strong as other jurisdictions, but in this case, the state has failed to meet the public and public interest groups' questions and concerns.

5. Consent by any impacted Tribe/First Nation is required for mine approval.

Consent by impacted tribes is not required for approval.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI "Prove it first" law).

The standards for application review are not as clear as they could be. The state requires specific information from an applicant (MCL § 324.63205(2)), but the only "standards" that an applicant must really meet are that its project will not "pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources" (MCL § 324.63205(11)) and that "the terms and conditions set forth in the permit application; mining, reclamation, and environmental protection plan; and environmental impact assessment will result in a mining operation that reasonably minimizes actual or potential adverse impacts on air, water, and other natural resources and meets the requirements of this act." MCL § 324.63205(2)(c). Of course, these standards could be interpreted in many ways and include the highly subjective "reasonably minimizes" language. The DEQ must deny a permit to any applicant who fails to meet "any part" of the Act, but without specific and clear standards required in the application itself, this fails to set a clear bar. MCL § 324.63205(10).

7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.

Yes, standards for reclamation and remediation must be approved as part of the permit application. MCL §324.63205(2)(c)(3). Also, the applicant must demonstrate that the methods proposed for both mining operations and reclamation goals are feasible to achieve the desired/stated goal.

8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.

While tribes must officially be provided notice, considered and consulted, they have little if any actual authority in the process. The tribes are consulted and are notified of changes that might affect their interests, but their requests are not automatically incorporated. Officially, they

[10] Full text of this letter is available online at http://standfortheland.com/2011/08/01/environmental-groups-ask-michigan-a-g-to-investigate-allegations-of-fraud-at-deq/#more-1357. Accessed December 22, 2011.

have no greater legal standing than any local unit of government or concerned citizen. As discussed above, in the Kennecott project, tribal concerns regarding access to treaty rights on ceded lands (hunting and fishing rights) and the demolition of Eagle Rock were not addressed to the tribes' satisfaction, leading them to sue (unsuccessfully thus far) to stop the project.

9. The state or province denies permits if they do not meet the regulatory standards.

The statute requires denial for failure to meet any requirement, MCL §324.63205(10), but this has not happened (yet) in practice. Many environmental groups and other citizen opponents of the Kennecott project have cited numerous areas where DEQ allegedly did not meet the regulatory standards for permit review, and allowed the developer to begin construction without having the required permits in hand. While the law requires denial of permit applications for failure to meet regulatory standards it is at least suspected that the agencies have not followed this to the letter. This is the very subject of the on-going litigation challenging the permitting of the Eagle Mine.

10. All state or province analytical materials and data are available to the public.

All analytical materials and data produced by DEQ is public, though technical data would not be automatically posted but would have to be requested. The DEQ's Freedom of Information Act procedures have improved in the past years after state reports critical of the Eagle Mine were deleted from computers and not made publicly available upon request.

11. The state or province requires that all data supporting an application be available to the public.

All data supporting an application is automatically posted on the department's website and disseminated to affected communities in informational meetings and print sources. The DEQ maintains a website for each project, but currently only includes Part 632 materials on the site; this is indicative of the bifurcated review process.

12. The state or province supplements applicant-provided data with its own, independently-gathered data.

The state relies primarily on data supplied by the applicant, but also collects its own air and water quality data and visits the site to confirm the applicant's data assertions. The frequency and comprehensiveness of the state's data collection could be greatly improved.

13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

Tribes have no delegated authority pursuant to §632 or its implementing regulations. Tribes are recognized only to the same extent as local units of government, i.e. they are to be notified of public meetings on new permits, and are to receive a copy of the permittee's annual report to the state. Tribes have federally-granted authority in water quality regulation only where tribe has "treatment-as-state" status.[11]

[11] Since the Clean Water Act is a federal law applying equally to all states, "treatment as state" status is equally available in all states. See Water Quality Report, Appendix A.

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.

This is not regulated specifically within the sulfide mining program, but is regulated through general state ethics laws. The Eagle Mine has cast doubt on the efficacy of the state's programs due to several employees transitioning directly from state employment (Governor's office and a reviewer of Kennecott's permit application) to employment by Kennecott, with no transparency about their intentions even when testifying on Kennecott's behalf just months before their change in employment.

15. Public funds may not be committed to financing or assisting project development until environmental review is completed.

Nothing in the Michigan Environmental Protection Act or Part 632 and its regulations prohibits the state from financing or entering into agreements with projects undergoing environmental review.

16. Financial assurance is calculated transparently and well-before any permit is issued.

The state hires an outside consultant to do the calculations and all data and calculations are available for public review. Financial assurance is a prerequisite for the permit to be issued; it is a required part of the permit application. MCL 324.63205(2)(e).

17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Financial assurance is based on an environmental analysis done primarily by the applicant, while the financial calculation itself is done by the state's consultant.

3. ENFORCEMENT

A regulatory structure is only as strong as its enforcement, including the mechanisms and powers granted to the regulators and whether and how the regulators actually use them. An ideal enforcement system gives regulators the tools and resources to enforce the standards set forth in statutes, rules and permits, and to ensure that deviations from or violations of those standards are reversed and adequately punished so as to deter future violations. In addition to having the authority, staff, and money to enforce the law, a meaningful enforcement system must have regulators capable of and committed to enforcement.

It is important to note that the lack of experience in regulating sulfide mines in the jurisdictions surveyed leaves a lack of certain data in this area. Until sulfide mines are permitted, operate, and close under the existing laws, it is impossible to say how a jurisdiction actually and fully enforces its laws and permit conditions, and this report does not speculate on such issues. Furthermore, we recognize that the strength of enforcement may depend to some extent on the political climate in a jurisdiction, and may therefore ebb and flow with legislative and executive changes. However, there is at least some experience to work from in some jurisdictions, and the basic capacity for enforcement is very clearly set out in the statutory authorization, staffing and funding of each jurisdiction's sulfide mining program.

In all states, a mine operator/owner holding a Clean Water Act (CWA) wastewater/stormwater permit will be subject to CWA penalties for violating those permits, including monetary sanctions and stop orders. In all states, citizens can sue operators for violations of CWA permits, with attorneys' fees awarded to successful plaintiffs. In all states, the CWA allows citizen intervention in NPDES permit, 404 and 401 appeals. This system of regulation operates in parallel with the mining permit enforcement scheme in each U.S. jurisdiction, but there is little to no operational overlap. For a review of states' CWA enforcement mechanisms, see the Water Quality Report at Appendix A.

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.
2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.
3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.
4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.
5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.
6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.
7. Citizens have access to all enforcement data.
8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.
9. Post-closure enforcement is strong, with adequate resources and public involvement.
10. Immediate independent judicial review is available to citizen plaintiffs.
11. Citizens can initiate and participate in inspections.
12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.
13. Permit conditions and work plans are reviewed at least annually.
14. The agency has authority to modify permit conditions whenever necessary ("adaptive management"), and exercises that authority as needed.
15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

Michigan's law provides a number of enforcement capabilities to DEQ, though it provides less than complete access and responsiveness to citizen concerns and complaints. There is also significant room for improving the specificity and requirements for monitoring ongoing operations. It remains to be seen whether and how the state will exercise this authority.

Overall Grade: Fair/Difficult to assess at this time

1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	SOME
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.	SOME
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	YES
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	NO
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	NO
6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	NO
7	Citizens have access to all enforcement data.	SOME
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	YES
9	Post-closure enforcement is strong, with adequate resources and public involvement.	N/A
10	Immediate independent judicial review is available to citizen plaintiffs.	NO
11	Citizens can initiate and participate in inspections.	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	SOME
13	Permit conditions and work plans are reviewed at least annually.	N/A
14	The agency has authority to modify permit conditions whenever necessary ("adaptive management"), and exercises that authority as needed.	YES, N/A
15	Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.	NO

DISCUSSION:

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.

Sulfide mine operators are subject to a number of financial and operational sanctions for violating their permit conditions, statutes, or administrative rules. These include:

Stop orders: Part 632 authorizes the DEQ to order an immediate suspension of mining activities if the permittee is in violation of the permit, the statute or regulations, and such violation is "causing or resulting in an imminent and substantial endangerment to the public health or safety, environment, or natural resources… ." MCL §324.63221(2). In this case, "the department shall

take action necessary to abate or eliminate the endangerment …" which may include "(b) Issuing an order to the operator requiring immediate suspension of activities at the mining site … ." Id.

Corrective action orders: DEQ is authorized to order the permittee to take corrective action. If the permittee is in violation of the permit, the statute or the regulations, "the department **shall** require the operator to correct the violation." MCL §324.63221(1).

Civil penalties: DEQ may bring a civil action via the state Attorney General against a permittee/violator in circuit court to seek a court-ordered restraint on the violation, require compliance, and/or a civil penalty of at least $2,500 and up to $25,000 per day of violation. §324.63223(1). However, DEQ cannot issue a civil penalty on its own, i.e., without a judicial order. If the court finds the operator has violated the statute, rule, permit, or department order and has caused a "substantial endangerment to the public health, safety or welfare", the court shall impose an **additional** sanction of at least $500,000 and up to $5,000,000. MCL §324.63223(2). Also, the Attorney General may seek an additional payment from the court to compensate for the injuries done to the natural resources of the state and the costs of the state's surveillance and enforcement activities. MCL §324.63223(3). Finally, criminal penalties are established and available for intentional false statements on applications for a mining permit or any notice or report required by the permit. MCL 324.63223(4).

Cost of inspection charged to permittee: Permittees are assessed a fee of "not more than 5 cents per ton of material mined […] but not less than $5,000.00, for each calendar year the mine is in operation and during the post-closure monitoring period." MCL §324.63215(a). This fee is authorized for "purposes of surveillance, monitoring, administration, and enforcement of this part … ." Id. The chapter also creates a "nonferrous metallic mineral surveillance fund" in the state treasury, to receive deposits of the permittee's fees. MCL §324.63217.

Attorney/staff costs: The cost of regulating permittees, including any attorney fees for departmental litigation, is funded only by the surveillance fund (see above). However, these fees are not charged directly to the permittee if they exceed the funds available in the surveillance fund.

Written policy available to public: DEQ maintains an environmental assistance center with phone number and an emergency spill hotline, but there is no handbook or written policy on citizen options/actions specifically regarding sulfide mining. The regulations and statute are the only real source of official information.

2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.

Michigan allows citizen intervention and court review of state enforcement actions, but does not allow for direct citizen suits of a violator of Michigan's mining law, regulations, or permit.

Any person who is "aggrieved by an order, action, or inaction of the department …" may request a contested case hearing before the Department pursuant to the Michigan Administrative Procedures Act ("MAPA"). MCL §§ 24.201 to 328; and §324.63219. This language is broadly written to encompass enforcement actions, allowing citizens to seek redress before DEQ when it

fails to administer the statutes or rules properly in an enforcement action or permitting decision. The agency's decision in such a case is then appealable to the courts. However, it is unlikely that a citizen successfully petitioning in such a case would be compensated her attorney's fees. MAPA awards attorney's fees and costs to a non-agency party prevailing in the contested case only if the agency's position in the case was "frivolous," MCL §24.323(1), and only to the extent that the agency caused the prevailing party to incur those costs and fees. MCL §24.323(5).

There is no provision for direct citizen suits against an alleged violator of the mining statute, rules, or mining permit. However, if the permittee is violating its NPDES permit, the Clean Water Act does allow for direct citizen suits against the violator.[12]

3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.

Citizens may intervene in permit proceedings, and in limited circumstances in state suits where they meet stringent standing requirements. In a permit proceeding, any person who is aggrieved "… by the issuance, denial, revocation, or amendment of a mining permit" may petition for a contested case hearing before the Department. MCL § 324.63219(1).

Intervention in appeals or suits by the state is not authorized by statute, but is allowed generally if the intervenor meets the specific standing requirements of the Michigan Rules of Civil Procedure. Michigan Court Rules, 2.201. These require that the intervenor claim "an interest relating to the property or transaction which is the subject of the action and is so situated that the disposition of the action may as a practical matter impair or impede the applicant's ability to protect that interest, unless the applicant's interest is adequately represented by existing parties." Id.

4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.

The existence of Part 632, dedicated to protecting the environment and human health from the potential dangers of sulfide mining sets the regulatory tone for the department. The state's role is to allow only those activities that are environmentally sound and ensure the permittee provides a contingency plan and funds for any problems. However, the political and legal fight over the progress of the Kennecott Eagle project is evidence that many in the department do not see it this way. Opponents of that project have alleged extreme mismanagement of the law by administrative personnel in both the Mining and Clean Water programs. The atmosphere at this point in time is charged with a great deal of suspicion and mistrust.

5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

Given the lack of enforcement experience, this cannot yet fully be evaluated. However, DEQ currently staffs the nonferrous mining program with only 1-1.5 full-time equivalent employees, and was operating at or beyond its capacity through the Eagle mine application review. It is reasonable to doubt that this number will be capable of overseeing the operational Eagle mine, plus at least one new full application, exploration of multiple new sites, and potentially many additional permit applications.

[12] See Water Quality Report, Appendix A.

6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.

There is no provision requiring periodic or regular inspections; inspections are required by law only on receipt of an allegation or notification of a permit violation. MCL § 324.63221(7)(b); R 425.408. The state's mining program coordinator, however, believes that inspections are required quarterly. In either case, the law and rules as written do not provide specific guidelines for inspections or thresholds for action in the case of potential permit violations.

7. Citizens have access to all enforcement data.

The project's annual report will be posted automatically, but any other information would only be available on request.

8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.

Post-closure monitoring is required for 20 years, subject to extension as needed or until the "self-sustaining ecosystem" goal is met. MCL 324.63209(6). Post-closure monitoring must be part of the reclamation plan filed with the initial application.

9. Post-closure enforcement is strong, with adequate resources and public involvement.

Resources for post-closure monitoring are assured through continued financial assurance (MCL § 324.63211(1), Rule 425.301(1)) and a surveillance fee (MCL § 324.63215). However, given the lack of experience with a post-closure scenario, this criterion cannot be evaluated as of yet.

10. Immediate independent judicial review is available to citizen plaintiffs.

There is no citizen suit provision; citizen complaints must go through the administrative review process first.

11. Citizens can initiate and participate in inspections.

Citizen participation in state-led inspections is not specifically permitted. The only way to "initiate" a state DEQ inspection would be to file an allegation or report to initiate a departmental investigation, but citizens cannot force the state to investigate nor participate actively in inspections. Non-agency personnel are allowed to participate in DEQ inspections under certain circumstances but only with the permission of the mine operator (property owner).

Citizens may find a more direct route to participation in inspections through their local governments. Local governments have an unfettered right to conduct water quality monitoring, even if such monitoring duplicates, contradicts or conflicts with Part 632. MCL §324.63203(5).

12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.

MCL § 324.63207(4) sets conditions for transfer of a permit, requiring public notice and continued compliance with statute and regulations. Agency staff asserts that in practice, the

mining permit must be transferred on sale or transfer of the project and the new owner/operator must assume responsibility for permit conditions, though this is not explicit in the statute.

13. Permit conditions and work plans are reviewed at least annually.

The permittee must file an annual "Mining and Reclamation Report" during operation and through the post-closure period. (Rule 425.501(1)). The report must contain, among other things, an updated (as needed) contingency plan, report of monitoring, leak detection, inspection and leachate collection for the preceding year. Agency staff assert that the agency naturally will review the report and react as needed. However, this is not required anywhere in statute or rule and has not yet been tested in practice, so this criterion cannot yet be evaluated fully.

14. The agency has authority to modify permit conditions whenever necessary ("adaptive management"), and exercises that authority as needed.

DEQ has the authority, but as of yet has no experience in this area. "The department may require the permittee to submit an application for amendment of the mining permit if the department determines that the terms and conditions of the mining permit are not providing the intended reasonable protection of the environment, natural resources, or public health and safety." MCL § 324.63207(6)(b); R 425.206. If the department determines the amendment will be a "material change," it will subject the amendment to the same review process as a new permit application (found at R 425.201(4)). R425.206(4).

In practice, DEQ has not independently required alteration of a permit condition, though it has altered the Eagle mine permit already at Kennecott's independent request. Whether DEQ will exercise its authority at the appropriate time(s) in the future remains to be seen.

15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

The ability of the DEQ to approve permit changes without a formal public process is a major weakness in Michigan's enforcement system. In its only experience to date, the Eagle mine permit, DEQ has approved several changes to the permit at Kennecott's request without giving a full opportunity for public comment and without a full review. Full review (i.e., the same review process as provided for new permit applications) is required only where DEQ determines the request would be a "significant change" to the permit. R 425.206(4). With each of Kennecott's five sets of proposed amendments, DEQ determined that the request was not a significant change, thereby not meriting a full review.[13] The requested changes included the addition of a communications tower, the extension of electrical power to the mine property, a change in location and increase in size of a rock storage area and wastewater treatment plant, a change in location and deepening of contact water basins, and etc. These changes drew significant public criticism but were all approved without formal hearings.

[13] Amendment approval letters are available on the DEQ website: http://www.michigan.gov/deq/0,1607,7-135-3311_4111_18442-130551--,00.html. Accessed December 21, 2011. DEQ did hold one public meeting regarding a proposed amendment, but this was not a formal process as outlined in the rules and was still deemed not a "significant change" by DEQ.

4. PROGRAM RESOURCES

In order to implement the provisions of statutes, rules, and permit conditions, a regulatory authority must have the resources to do so. Necessary resources include time, money, expertise and personnel. Ideally, the state or province funds the sulfide mining program adequately and ensures that payments and penalties assessed against mine owners and operators go back to the mining program. Such funding or self-funding must be adequate to cover the program's needs in all stages including regulating exploration and prospecting, reviewing permit applications, overseeing ongoing mining operations and reclamation activities, and post-closure monitoring.

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.
2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.
3. The state or province allows civil penalties to be used by the mining regulation program.
4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

Though Michigan has never regulated a sulfide mine from application through reclamation, its limited experience has nonetheless revealed a significant resources shortfall in the program. The financial assurance mechanisms and other avenues of funding the program and its work (e.g., penalties and application fees) are not written in a way that ensures adequate program support.

Overall grade: Poor

1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	NO
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	NO
3	The state or province allows civil penalties to be used by the mining regulation program.	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	SOME

Discussion:

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.

Michigan's funding mechanisms for regulating sulfide mining are inadequate. The regulation of sulfide mining is funded by application fees ($5,000 per application) and a per-ton-excavated operating fee (a minimum $5,000/year through the operational and post-closure phases). A lack of funding has never forced a cutback in staff or resources or led to delays in permitting or other decisions, and DEQ's program director Hal Fitch states that its current 1-1.5 FTE staff working on the program are all that it needs, given that there has been only one application in the last 10 years. Though there are imposed timelines on decision-making in many phases, DEQ has been able to take extensions where needed.

On the other hand, Mr. Fitch has also publicly stated that DEQ's work reviewing, assessing, and processing the Eagle mine application has cost the state approximately $800,000 and "[w]e'll probably never get all of that back."[14] There have been calls to change the law to increase fees and/or taxes on mines, but so far no concrete action has been taken.[15] Also, there has been a serious challenge issued to the DEQ that its review of the Kennecott project has been inadequate and lacked the necessary expertise, even to the point of alleged fraud. There are numerous instances cited in which DEQ has not fully addressed the citizen groups' concerns and/or failed to enforce its own regulations in the permit and environmental assessment review. Whether these failures are the result of poor staffing and a lack of resources and expertise, however, is an open question.

While DEQ and other state agencies have not been asked to monitor and enforce the rules with regard to an ongoing operation, the Eagle mine will soon provide a test. However, compared to the funding systems of other states, and given the apparent shortfall already generated by processing just one application, Michigan's funding of its sulfide mining program is patently inadequate.

2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.

The permit application fee is $5,000 and is therefore nowhere near commensurate with the state's actual costs of reviewing an application. The permit application fee goes into a fund in the state treasury earmarked for the exclusive use of the department to regulate sulfide mining, but this in itself cannot make up for the fundamental shortfall created by the low permit fee.

3. The state or province allows civil penalties to be used by the mining regulation program.

There is no provision for direct allocation of civil penalties to the mining regulation program.

4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

DEQ staff states that the funds would be safe from creditors,[16] but the statute and rules are not so clear. The rules require a permittee to notify DEQ of the commencement of voluntary or involuntary bankruptcy proceedings (R 425.302(17), but there is no provision in the rules about assurance instruments that requires such instruments be safe from the permittee's creditors

[14] Tina Lam, "Will mines get state's riches for a paltry sum?" *Detroit Free Press*, Nov. 28, 2011.
[15] Id.
[16] Hal Fitch, Michigan DEQ, Office of Geological Survey (personal communication, July 5, 2011).

in a bankruptcy situation. Allowable forms of financial assurance include: trust fund, escrow account, surety bond, irrevocable letter of credit, COD or time deposit account. Rule 425.301-307. Also, only 75% of the total financial assurance amount must be deposited or accounted for in regular assurance instruments, while the remaining 25% can be covered through a "statement of financial responsibility." R 425.301(3).

While not necessarily safe from creditors, DEQ has nearly unfettered access to the funds. Funds are directly accessible when needed to "curtail or remediate any damage to the environment or public health" or recover "any costs the department has incurred." R 425.302(15). This language is very broadly written, and allows DEQ to draw on assurance monies not only for reclamation activities but also monitoring activities, at any time during the life of the permit or in the post-closure phase. See R 425.302(16) and R 425.301(2). The DEQ can require additions to the funds if necessary.

5. REPORTING AND OFFICIAL STATEMENTS

An ideal sulfide mining regulatory program requires the highest quality data from permittees so decisions and actions are based in fact, not simply on a permittee's assurances. Not only must the permittee be accountable to the regulators, but the regulators must be accountable to the public whose safety and resources they are charged to protect. In order to assess these factors, the following criteria were considered:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

For information on water quality monitoring and reporting, see the Water Quality Report, at Appendix A.

While Michigan's law requires public access to monitoring reports and underlying data, it fails to provide any standards for regulatory review of those reports, nor have such standards been developed at the agency level. Though there is not much of a track record for evaluating the rigor of the state's review, the state's technical review of the Kennecott project has been met with severe criticism, both internal and external. For that reason, Michigan is only fulfilling some of the criteria for reporting and official statements.

Overall grade: Poor

1	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	NO
2	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	SOME

Discussion:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

Though the state has little experience in assessing or creating reports yet, it has been sharply criticized for its assessments so far in the Kennecott project and there is a definite lack of regulatory standards in this area. For these reasons, Michigan does not meet the criterion. There are no specific standards for accuracy, integrity, or review in the sulfide mining statute or rules, and DEQ has no set policy for evaluating the veracity and accuracy of an applicant or permittee's data submissions. The state does not conduct routine quantitative measurements of mine conditions on its own, and though it has the authority to conduct ad hoc sampling, DEQ staff states that in practice, this would be mostly visual inspection. All the parameters for sampling and monitoring are set on a case-by-case basis, and while the parameters for monitoring water quality are set in Rules (R 425.406), they are designed specifically for each site and set in a monitoring plan approved by the department prior to commencement.

As already noted, DEQ has no experience yet with a mine in operation under the current legal regime. However, data submissions from the proposed Kennecott Eagle project have come under severe scrutiny by both independent citizen and environmental groups and by consulting staff hired by DEQ.[17] So far these shortcomings have not resulted in any negative permitting decisions or operational delays to the project.

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

Staff reports that all monitoring reports are posted on the DEQ's website and all field inspections and so on would also be available, but there is no requirement as such. The raw data sets underlying both departmental and permittee reports are available to the public, as there is no automatic confidentiality for any monitoring report or underlying datasets. Before mining at the Eagle Mine, portions of the application were difficult to obtain.

RECOMMENDATIONS

Recommendations for Michigan, Wisconsin and Minnesota:

1. There should be a formal, standard method set forth in the law to coordinate the efforts of the various agencies responsible for different aspects of permitting, monitoring, and enforcement of a mining project.
2. State-conducted independent monitoring should be conducted regularly and systematically at any active mine and reclamation site, including in the post-closure phase, and should be funded by the permittee. Leaving this essential task to the permittee is unacceptable. DEQ should be required, not just empowered, to take immediate action to stop and/or remediate any problem found.
3. Affected tribes should be empowered to participate in permit decisions and monitoring.

[17] See DEQ record of permit review, supra note 41.

4. Mine plans should include non-environmental goals and standards such as workers' safety, long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.
5. Public funds must not be committed to financing or assisting any project that has not completed and passed environmental review. This should be a matter of law with no exceptions.
6. Civil penalties and fees assessed for noncompliance should be dedicated to return to the nonferrous metallic mining program.

Michigan-specific recommendations:

1. Exploratory activities should be regulated.
2. Environmental Assessment should not be done by the applicant but by the state, and should be funded by the applicant.
3. The lack of siting criteria is a major shortcoming in Michigan's application process. Areas of special sensitivity such as wetlands, waterways, and land protected by state or federal designations should be considered unsuitable for mining activities or at least be subject to heightened review. Setbacks and buffers between mining activities and public rights of way, structures, and so on should be systematized and standard.
4. Michigan's highly protective remediation goal must be supported by objective, technical standards for permit applications and reclamation plans. An applicant must be able to demonstrate that its proposed mining and reclamation activities meet the standards and adhere at a minimum to the best industry practices available. For instance, the law provides no specifics for how to achieve structural integrity or a minimum level of safety in a mine.
5. The law should require the state to address each and every potential impact identified in the EA and approve an application only when it positively determines that all of the application standards set forth in the rules are met. Technical requirements and minimum standards for data should be clear and mandatory. Setting standards is meaningless unless the agency is bound to enforce them.
6. The financial assurance mechanism should be redrafted to ensure that funds are safe from creditors and the permittee has committed 100% of the projected costs to financial assurance instead of only 75%.
7. The state should improve its integration of and responsiveness to public concerns and questions regarding permit applications, regardless of whether the citizen(s) are directly affected by the proposal. All citizens have a recognized interest in and right to preserving the state's resources.

8. Funding of the mining program must be improved. Permit application fees should be raised to a higher set price or, ideally, should be based directly on the state's costs of reviewing the application and completing an independent environmental assessment. Once permitted, the permittee should be directly responsible for funding the state's monitoring and enforcement activities.
9. Citizens should be allowed to initiate immediate civil enforcement actions where the state is not taking sufficient action.

This report was made possible by funding from the C.S. Mott Foundation. The views expressed herein are solely those of the authors, National Wildlife Federation ("NWF") and Ecojustice, and not the Foundation or its staff.

(Cover Photo: Adam Kahtava)