



EHRA

**ENVIRONMENT AND
HUMAN RIGHTS
ADVISORY**

PO Box 927 Yachats, OR 97498
www.environmentandhumanrights.org
ehra@environmentandhumanrights.org

A Human Rights Assessment of Hydraulic Fracturing for Natural Gas

Prepared for: Commissioner Joe Martens
New York State Dept of Environmental Conservation
625 Broadway
Albany, NY 12233-1010

Commissioned by: Earthworks' Oil and Gas Accountability Project
Bruce Baizel, Esq., Senior Staff Attorney
1612 K Street NW, Suite 808
Washington, DC 20006

Matter of Concern: Environmental and Human Health Impacts Associated
with Hydraulic Fracturing Operations

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Copies: Hon. Andrew M Cuomo, Governor
Lisa Jackson, Administrator, Environmental Protection
Agency
Joseph Heath, Esq., Onondaga Nation General
Counsel
US Representative Maurice Hinchey
Members of the Governor's High Volume Hydraulic
Fracturing Advisory Panel

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Executive Summary

A recent United Nations General Assembly document¹ informs the UN Human Rights Council that the environmental damage caused by hydraulic fracturing for natural gas poses “a new threat to human rights.” And a recent United Nations Resolution states that “environmental damage can have negative implications, both direct and indirect, for the effective enjoyment of human rights.”²

This human rights report is intended to detail for the New York State Department of Environmental Conservation and for Earthworks' Oil and Gas Accountability Project, specific ways in which hydraulic fracturing threatens to compromise human rights norms.

Facts

New York State is considering policies that could result in the development of 30,000 to 90,000 hydraulic fracturing operations for natural gas in subsurface shale deposits³ on lands in New York State, including on lands of the Onondaga Nation.

Despite claims of economic benefit, hydraulic fracturing presents significant risks to local air quality, to ground and surface waters, to soils and ecosystems and to several dimensions of human health. Risks to air quality result from the chemicals used in and resulting from fracking processes; from fugitive emissions of raw methane; from accidental emissions; and from diesel exhaust due to heavy truck traffic and diesel generators.

Water concerns include possible dewatering of aquifers from high-volume extractions, contamination of ground water and drinking water wells with methane and fracking chemicals, and the permanent removal of several billion gallons of water per year from the earth's hydrologic cycle.

The possibility of accidents increases risks for air and ground water contamination.

Accidental emissions of raw methane, a powerful greenhouse gas, as well as high volumes of diesel emissions, are expected to contribute to global climate change.

The current state of knowledge about potential human health and environmental impacts of these airborne and waterborne contaminants, as well as of their mixtures and interactions, is poor, though some fracking chemicals even now are known to be endocrine disruptors and neurotoxins and some have been designated by the EPA as probable or known carcinogens. This suggests a need

for caution and for gathering further information before proceeding with licensing, especially since vulnerable and disadvantaged populations would be at even greater risk.

Viewed in light of human rights standards, these facts may raise liability concerns for the New York State Department of Environmental Conservation.

Human Rights norms of concern

This report details twenty-six human rights norms of concern, including:

- The right to security of person and bodily integrity. This most basic of rights is articulated in many human rights treaties, including the instruments that make up the International Bill of Human Rights.
- The family's right to protection.
- The right of motherhood and childhood to special care and protections.
- The right of the child to the highest standard of health.
- The right to prior, free and informed consent.

In addition, the Declaration of Alma-Ata reminds states that they have a positive duty to regulate agricultural, forestry, industry, manufacturing and other sectors to protect citizens' health.

Human rights standards are justified moral claims held by all persons vis-à-vis their governments, and moral duties that governments at all levels owe their citizens.

Human rights standards are recognized as trumping other types of policy considerations such as utility, cost-benefit analysis, economic value, social policy, etc. Additionally, human rights norms represent basic moral minimums, a moral floor beneath which state and state-regulated behaviors must not sink. If civil laws represent hard legal boundaries outside of which certain behaviors are not legally permissible, human rights standards represent hard ethical boundaries outside of which certain behaviors are not morally permissible.

Governments that sign human rights documents, as the US has done, commit themselves to promulgating these norms and to being held accountable to them.

Potential liabilities

Potential consequences of allowing fracking operations to go forward include a risk of public and perhaps media perception that the New York State government does not respect human rights norms, potentially resulting in diminished trust by affected communities. Institutional trust is not high in communities already impacted by fracking operations in other states, and if lost in New York, could take decades to win back.

Potential economic risks include liability insurance carriers reconsidering their coverage, conditions and premiums for losses related to fracking operations.

Other economic risks include potentially costly legal actions brought against the New York State DEC for failure to adequately regulate fracking practices as a violation of human rights, possible legal action with respect to the Americans with Disabilities Act, and possible multiple small claims court actions.

One goal of human rights activism, often referred to as “the mobilization of shame,” involves human rights organizations using tools such as media attention, video recording of actions considered to be human rights violations and of persons responsible for them, posting those videos publically, and holding formal citizens’ inquiries and tribunals.

Measures to reduce liabilities

To reduce liabilities the New York State Department of Environmental Conservation should require:

1. a comprehensive study of human health impacts related to fracking be undertaken prior to any agreement to license fracking operations.
2. maximum transparency about materials and processes for all aspects and phases of fracking operations, including full disclosure of all chemical inputs and outputs.
3. full cost accounting, including costs for externalities such as impacts on infrastructure, social services, and human and environmental health.
4. a comprehensive, systemic approach to water usage that tracks, records and makes publicly available each step of the process from withdrawal to disposal.
5. development of a high quality, information rich, broad-based communication strategy for providing ongoing, factual information, as unbiased as possible, about all aspects of all phases of development, drilling and fracking operations.
6. health effects monitoring studies, preferably cohort studies, to be undertaken by the Department of Health or independent third parties. Citizen groups should be actively involved in the design, planning, implementation and monitoring of these studies.
7. regular monitoring of ambient air quality, local ground and surface water quality, including local drinking water wells, for chemicals used in and

- outputted from fracking processes. Baselines should be established before fracking operations begin.
8. oversight by external observers, agreed to by the Governor, representatives of the Onondaga Nation and local citizen environmental organizations, to monitor implementation of these studies.
 9. strategies for insuring that place-bound persons, such as disabled persons living in homes near fracking operations, those in daycare facilities, elder care facilities, hospitals, schools, etc, not be required to endure chemical, noise and light pollution impacts from fracking operations.
 10. strategies for insuring that children, the elderly and other vulnerable populations, not be required to endure exposures from fracking operations.

A Human Rights Assessment of Hydraulic Fracturing for Natural Gas

Purpose of This Report

The purpose of this Report is to provide the New York State Department of Environmental Conservation (DEC) and Earthworks' Oil and Gas Accountability Project (OGAP) a list of formal human rights norms of concern associated with hydraulic fracturing operations for natural gas, to outline DEC's potential liabilities and to outline measures DEC can take to reduce those liabilities.

Facts

New York State is considering policies and regulations that could result in the development of 30,000 to 90,000 hydraulic fracturing operations for natural gas in subsurface shale deposits⁴ on lands in New York State, including on lands of the Onondaga Nation.

Hydraulic fracturing, though exempted from normal regulatory standards in the Clean Air Act, the Safe Drinking Water Act and the Superfund Act (CERCLA) among others, presents, both in its developmental and operational phases, risks to local air quality, to ground and surface waters, to soils and ecosystems and to several dimensions of human health.

Air

Risks to air quality include: chemicals used in the fracturing process; chemicals in drilling wastewater, “produced water,” stored in holding ponds; fugitive emissions of methane and other gases; diesel exhaust resulting from heavy truck traffic and diesel generators; and accidental emissions during maintenance and inspection operations (e.g. “pigging” of pipes).

Each fracking operation can require ten- to forty-thousand gallons of several hundred different chemicals – a variety of acids, friction reducers, corrosion inhibitors, biocides, and sometimes formaldehyde and BTEX chemicals (benzene, toluene, ethylbenzenes and xylene). Most arrive by truck.

Each fracking operation at each well can require as many as 1000 truck trips, with attendant exposure to diesel particulates as well as to round the clock noise and light pollution. Diesel exhaust is a risk factor for a variety of adverse health effects, including lung cancer, emphysema, diabetes, cardiac arrhythmias, stroke and heart attacks.

Water

Each fracking operation requires two to four million gallons of fresh water, much of it arriving by truck. Approximately one to two million gallons of fresh water per fracking operation will remain underground, permanently removed from the earth’s hydrologic cycle.

Dewatering of aquifers resulting from ongoing high-volume extraction is a risk.

Studies have shown methane present in drinking water wells in the vicinity of some fracking operations.

The drilling wastewater, made up of “produced water” and “flowback,” contains hydrocarbons, heavy metals, radioactive materials, a range of additives such as

BTEX chemicals and other toxics. It is considered hazardous waste and requires special handling, but there is as yet no clear agreement about how best to dispose of it.

The possibility of accidents such as well-installation errors, well fires, blow-outs, chemical spills, waste pit leaks, cracked well bore casings,⁵ vehicle accidents, etc., increases risks for air and ground water contamination.

Health

Adequate information about human health effects and environmental impacts of these individual airborne contaminants, as well as of their mixtures and interactions, is not yet available, but it is known that risk of adverse health impacts rises with an increase in exposure to environmental toxics.

Some of these airborne chemicals have been identified as endocrine disruptors, some are known neurotoxins and some have been designated by the EPA as probable or known carcinogens. One study found a strong association between maternal benzene exposure and adverse birth outcomes such as spina bifida.⁶

Vulnerable populations – infants, children, the elderly, cancer survivors, those with compromised immune response – are at increased risk. Socially and economically disadvantaged populations may also be at increased risk.

Climate change

Fracking operations result in verifiable air emissions of raw methane, a recognized greenhouse gas, and burnt methane fumes, both of which, in addition to diesel emissions, are known contributors to climate change.

Issues

Residents of New York state and people of the Onondaga Nation are concerned about a range of issues, including:

- adverse acute human health impacts particularly for children, the elderly, the disabled, the place-bound and other vulnerable groups;
- adverse long-term human health impacts that may not become clinically evident until some time has passed, particularly for children, the elderly and other vulnerable groups;
- adverse social and economic impacts, particularly for vulnerable populations;
- the storage, use and disposal of hazardous materials, especially on indigenous people's lands;
- degradation of ambient air quality resulting from increases in volatile organic compounds, other hazardous air pollutants, diesel emissions, dust and particulate matter;
- contamination of groundwater and drinking water wells;
- contamination of rivers, streams and other water sources upstream of drinking water intakes;
- the permanent removal of several billion gallons per year of fresh water from the earth's hydrologic cycle;
- heavy truck traffic during both development and operational phases of fracking, with resulting air pollution from diesel exhaust;
- noise pollution from round the clock operations;
- light pollution from round the clock operations;
- property damage and damage to soils, lands and ecosystems;
- loss of property value due to the effects of nearby fracking operations;
- community disruption and adverse impacts on quality of life;
- increased risk of accidents, well blowouts, fires, explosions and vehicle crashes;
- adverse impacts on climate change resulting from accidental raw methane releases caused by inadequate well design or construction, leaks, accidents and other fugitive emissions;
- unsafe disposal of, for each fracking operation, one to two million gallons of waste fluids containing toxic chemicals, brine and radioactive materials, with no existing technology capable of making it clean again;
- possible increased risk of earthquakes near fracking sites.⁷
- adverse impacts on individuals and families who are unconsenting, i.e., on those in a community who choose to not sign leases but who still suffer the same impacts as others in the area who do.

Human Rights Norms of Concern

Environmental concerns often directly impact human rights, and the purpose of this Report is to help the New York State Department of Environmental Conservation and Earthworks' Oil and Gas Accountability Project appreciate the human rights dimensions of high volume slick-water hydraulic fracturing practices. As Daniel Taillant, Director of the Argentine-based Center for Human Rights and the Environment says, "Everything and anything that influences the environment directly influences our human condition, and a violation of the environment is a violation of our human rights."⁸

Human rights standards are justified moral claims that each citizen has vis-à-vis their government, and moral duties that governments at all levels, including state and local, have toward their citizens.

Human rights standards apply to individuals, not just to majorities, and in the case of indigenous peoples, to communities. This means that if even one or two persons' rights are violated, or if a single indigenous community's rights are violated, then human rights violations have occurred.⁹ Some of the following rights are grounded in legal authority – ADA rights, rights in the Nuremberg Code, protections against chemical trespass, etc. But all of these rights, including those without grounding in domestic law, are recognized as grounded in moral authority.

Human rights standards are recognized as trumping other types of policy justifications such as utility, cost-benefit analysis, economic value, social policy, etc.; i.e., "right-holders are authorized to make special claims that ordinarily 'trump' utility, social policy, and other moral or political grounds for action."¹⁰ Additionally, human rights norms represent a moral minimum for behavior of governments and non-state actors, a moral floor beneath which policy and state-regulated behaviors must not sink.¹¹

As civil laws represent hard legal boundaries outside of which certain behaviors are not legally permissible, human rights standards represent hard ethical boundaries outside of which certain behaviors are not morally permissible.

Listed below are 26 specific human rights norms with direct relevance to hydraulic fracturing practices. (This list does not include rights that may be protected by the US or state constitutions or by state statutes.) These norms have been articulated in several human rights declarations, conventions, charters and other international instruments, including:

- *Universal Declaration of Human Rights (UDHR)*
- *International Covenant on Civil and Political Rights (CCPR)*

- *International Covenant on Economic, Social and Cultural Rights (CESCR)*
- *Convention on the Rights of the Child (CRC, 1990)*
- *Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)*
- *United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)¹²*
- *Rio Declaration on Environment and Development*
- *The World Health Organization Declaration of Alma Ata¹³*
- *The Nuremberg Code¹⁴*

Governments that have signed these instruments, as the US has done, have committed themselves to promulgating these human rights standards and to being held accountable for them.

The first three documents above, UDHR, CCPR and CESCR, are usually considered primary and are often referred to as the international bill of human rights, so in the rights enumerated below they are listed first when identifying documents in which these norms have been articulated.¹⁵

1. Right to life, liberty and security of person.

Articulated in

UDHR Article 3

“Everyone has the right to life, liberty and security of person.”

CCPR Article 9

“Everyone has the right to liberty and security of person.”

What this right entails

This is the right to be safe and secure in one’s person.

Reasons for concern

- o Documented reports of adverse physical health effects associated with exposures to air and water contaminants associated with hydraulic fracturing practices.
- o Potential adverse health effects associated with exposures to air and water contaminants associated with hydraulic fracturing practices can include respiratory, cardiovascular, dermal and neurologic impacts, as well as miscarriages and birth anomalies, particularly for pregnancies conceived or carried during periods of exposure.
- o If any citizens consider that injury or threat of injury from exposure to contaminants resulting from fracking practices will require them to move out of the area, particularly if that would result in documentable economic loss, that would be an encroachment on this right.

2. Right to privacy and home

Articulated in

UDHR Article 12

“No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence....”

CCPR Article 17

“No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence.”

What this right entails

This is the right to be secure in one’s home, to be able to enjoy the use of one’s property and to not have one’s property devalued as a result of a state’s failure to adequately regulate.

“The European Human Rights Court noted that severe environmental pollution may affect individuals’ well-being and prevent them from enjoying their homes in such a way as to affect their private and family life adversely, without, however, seriously endangering their health.”¹⁶

This means that adverse health effects are not the only kind of adverse effects that violate the right to one’s property and home.

Reasons for concern

- o Discomfort experienced at home, or a compromised ability to enjoy one’s home and property due to air and water contaminants, as well as noise and light pollution, associated with hydraulic fracturing operations, even without adverse health effects.
- o Potential adverse physical health effects from exposures to air and water contaminants associated with hydraulic fracturing operations and suffered in the home.

3. The family’s right to protection

Articulated in

CCPR Article 23

“The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.”

CESCR Article 10

“The widest possible protection and assistance should be accorded to the family, which is the natural and fundamental group unit of society, particularly for its establishment and while it is responsible for the care and education of dependent children.”

What this right entails

This means that the health, strength, well-being and social integrity of families must be protected and supported; if these become compromised as a result of exposures associated with hydraulic fracturing operations then this right has been abridged.

Reasons for concern

- o Adverse physical or economic effects on families attributable to exposures associated with hydraulic fracturing operations would encroach on this right.

- o If the health or well being of families, including economic well being, have been adversely affected as a result of hydraulic fracturing practices, that would be an encroachment on this right.

4. Right to property

Articulated in

UDHR Article 17

“No one shall be arbitrarily deprived of his property.”

What this right entails

See number 2 above regarding the right to privacy and home.

Reasons for concern

- o Any adverse physical or economic impacts on property or property values attributable to activities and exposures associated with hydraulic fracturing practices would encroach on this right.
- o If individuals, families or businesses have been forced to leave or sell their property due to hydraulic fracturing operations, that would be an encroachment on this right.
- o If individuals’ or families’ ability to enjoy the use of their property has been compromised due to hydraulic fracturing operations, that would be an encroachment on this right.
- o Loss of property value attributable to impacts of hydraulic fracturing practices would encroach on this right.

5. Right to work

Articulated in

CESCR Article 6

“The States Parties to the present Covenant recognize the right to work, which includes the right of everyone to the opportunity to gain his living by work which he freely chooses or accepts, and will take appropriate steps to safeguard this right.”

What this right entails

This right refers to the right to work and, by extension, the right to be able to transport oneself to work without being made sick along the way.

Reasons for concern

- o Citizens who become unable to work because of disabilities resulting from exposures associated with hydraulic fracturing practices.
- o Citizens who are unable to work because their place of work is located in or near hydraulic fracturing operations.
- o Citizens who may be unable to transport themselves to work due to their need to avoid exposure to contaminants associated with hydraulic fracturing practices.
- o Workplaces that have been contaminated by hydraulic fracturing practices enough that some workers are unable to perform their work or keep their jobs would be an encroachment on this right.

6. Right to safe and healthy working conditions

Articulated in

CESCR Article 7

“States Parties to the present Covenant recognize the right of everyone to the enjoyment of just and favourable conditions of work which ensure...[s]afe and healthy working conditions.”

What this right entails

This entails the right to a safe and healthy work environment.

Reasons for concern

- o Adverse physical effects experienced in the workplace that are attributable to nearby hydraulic fracturing operations.
- o Workplaces becoming less safe for some as a result of contamination by hydraulic fracturing practices.

7. Motherhood and childhood’s right to special care

Articulated in

UDHR Article 25

“Motherhood and childhood are entitled to special care and assistance. All children...shall enjoy the same social protection.”

CESCR Article 12 (section 2a)

establishes the obligation of states party to this Covenant to take steps to make “provision for the reduction of the stillbirth-rate and...infant mortality and for the healthy development of the child.”

CRC Article 27

“1. States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development.”

UNDRIP Article 22 (section one)

“Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities....”

What this right entails

This is the right of children, their mothers and indigenous elders and persons with disabilities to be provided special care, protection and assistance. This means that both state and non-state actors have a positive duty to protect children, their mothers and indigenous elders and persons with disabilities from anything, including exposure to environmental toxics, which may compromise their physical, mental, spiritual or social well-being.

Reasons for concern

- o Children are at much greater risk than adults because of their increased biological susceptibility to adverse health effects from exposure to environmental toxics.

- o Preliminary research indicates that fetuses and pregnant mothers are at risk for adverse effects from exposure to contaminants associated with hydraulic fracturing practices.
- o If mothers, and mothers' ability to protect their children and be good caregivers, are adversely affected by activities and exposures associated with hydraulic fracturing, that would be an encroachment on this right.

8. Duty to protect the child (i.e., persons under age 18):

Articulated in

CRC Article 19

"States Parties shall take all appropriate legislative, administrative, social and educational measures to protect the child from all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, [or] maltreatment...."

CESCR Article ten (section three)

"Special measures of protection and assistance should be taken on behalf of all children and young persons without any discrimination for reasons of parentage or other conditions."¹⁷

UNDRIP Article 22 (section one)

"Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration"¹⁸

What this right entails

This is the child's right to special protections, and the state's duty to provide special protections, from infliction of harm, including harm that could result from unavoidable exposures to environmental toxics.

Reasons for concern

- o See #7 above.

9. Right of the child to the highest standard of health

Articulated in

CRC Article 24

"States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health."

UNDRIP Article 17 (section two)

"States shall in consultation and cooperation with indigenous peoples take specific measures to protect indigenous children from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development, taking into account their special vulnerability and the importance of education for their empowerment."

What this right entails

This is the right of children to live in safe and healthy conditions, including safe and healthy environmental conditions, and not to have to undergo exposure to conditions that adversely affect health.

Reasons for concern

- o Activities that put children at increased risk of adverse health effects would be an encroachment on this right.
- o Adverse health effects associated with hydraulic fracturing practices can include respiratory, cardiovascular, dermal and neurologic effects, as well as miscarriages and birth anomalies, particularly for pregnancies conceived or carried during periods of exposure.

10. Right of all persons to the highest standard of health

Articulated in

CESCR Article 12

“States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.”

UNDRIP Article 24 (section 2)

“Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health.”

What this right entails

This is the right to live in conditions conducive to the highest standard of health.

Reasons for concern

- o Activities that put citizens at increased risk of adverse health effects would be an encroachment on this right.
- o Adverse health effects attributable to exposures to hydraulic fracturing practices can include respiratory, cardiovascular, dermal, carcinogenic and neurologic effects, as well as miscarriages and birth anomalies, particularly for pregnancies conceived or carried during periods of exposure.
- o Adverse psychological health effects shown to be related to hydraulic fracturing practices would be an encroachment on this right.¹⁹

11. State’s duty to provide for the health of citizens

Articulated in

The Declaration of Alma-Ata, Article V

“Governments have a responsibility for the health of their people which can be fulfilled only by the provision of health and social measures.”

What this right entails

This language more clearly reframes the right to health as a positive duty of a government to its citizens to provide for the health of its citizens.

Reasons for concern

- o See #10 above

12. State's duty to provide for the health of citizens demands coordinated efforts of all sectors.

Articulated in

Declaration of Alma-Ata Article VII

[Provision of health measures includes,] "in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors."

UNDRIP Article 29 (sections two and three)

"States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.

States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented."

What this duty entails

These articles elucidate the meaning of "provision of health and social measures," saying that a state's duty to provide the highest standard of health for its citizens extends beyond the health sectors of governments; it involves all other sectors as well, including the duty to insure that the industrial, manufacturing and environmental conservation sectors are regulated in ways that are protective of citizens' health. In the case of indigenous peoples, this includes the duty to insure that no hazardous materials – including the hazardous chemicals used in hydraulic fracturing and the flowback fluids that result from it – shall be stored or disposed of on the lands of indigenous peoples "without their free, prior and informed consent."

Reasons for concern

- o These articles say that in addition to departments of health, all government departments, including departments of agriculture, transportation, environmental conservation and other agencies that deal with chemicals and other health risks also have a positive duty to protect the health of citizens.
- o Because hydraulic fracturing is a chemical-intensive process there is concern, particularly for indigenous communities and lands, about the siting, use, storage and disposition of both hazardous inputs required for the fracking process and hazardous outputs that result from it.
- o If hazardous materials were to be used, stored or disposed of on lands of native peoples without their prior, free and informed consent, that would be an abridgement of this right.

13. Right to a healthy environment

Articulated in

Aarhus Convention Preamble

“every person has the right to live in an environment adequate to his or her health and well-being, and the duty, both individually and in association with others, to protect and improve the environment for the benefit of present and future generations.”

What this right entails

This Convention articulates both a right and a duty. The right is to live in an environment adequate to one’s health and well-being. The duty is to protect the environment so this right is respected.

Reasons for concern

- o Hydraulic fracturing practices that compromise the environment or cause conditions injurious to health, even if those conditions affect the health of some people more than others, would be an encroachment on this right.

14. Right to safe drinking water

Articulated in

UDHR Article 25 (section 1)

“Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services....”

CESCR Article 11 (section 1)

“The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing....”

UN Resolution 64/292. The human right to water and sanitation²⁰

“The General Assembly... [r]ecognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights.”

What this right entails

This is the right to safe and clean drinking water.

Reasons for concern

- o If drinking water drawn from the well of a private residence, institution or community were to be contaminated or otherwise compromised by hydraulic fracturing operations that would be an encroachment on this right.
- o If the river, stream or other water source from which a community draws its drinking water were to be contaminated or otherwise compromised by hydraulic fracturing operations, that would be an encroachment on this right.
- o The permanent removal of several billion gallons of fresh water each year from the earth’s hydrologic cycle, particularly given the scarcity of potable water around the globe, compromises this right.

15. Duty to encourage school attendance

Articulated in

CRC Article 28, 1(e)

"[States Parties shall] [t]ake measures to encourage regular attendance at schools."

What this right entails

If states are enjoined to take measures "to encourage regular attendance at schools," it follows that they are also required, *a fortiori*, to proscribe measures that make it difficult or impossible for students to attend school.

Reasons for concern

- o Hydraulic fracturing practices that would prevent some students from attending school or being transported to school due to their need to avoid chemical exposures would be an encroachment on this right.
- o Hydraulic fracturing practices that expose students to chemicals while waiting for school buses would be an encroachment on this right.
- o Hydraulic fracturing practices occurring near enough to schools that some students are unable to attend or remain in school would be an encroachment on this right.

16. Right to education

Articulated in

CESCR Article 13 (section 1)

"States Parties to the present Covenant recognize the right of everyone to education."

Reasons for concern

- o See #15 above.

17. Right to effective remedy, redress and mitigation

Articulated in

CCPR Article 2(3)a

"Each State Party to the present Covenant undertakes: To ensure that any person whose rights or freedoms as herein recognized are violated shall have an effective remedy, notwithstanding that the violation has been committed by persons acting in an official capacity...."

UNDRIP Article 28

"Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent."

UNDRIP Article 32 (sections two and three)

"States shall provide effective mechanisms for just and fair redress for any such activities [i.e., "any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources"²¹], and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact."

UNDRIP Article 40

“Indigenous peoples have the right to access to and prompt decision through just and fair procedures for the resolution of conflicts and disputes with States or other parties, as well as to effective remedies for all infringements of their individual and collective rights.”

What this right entails

“The legal obligation to offer restitution for injury is as old as the Code of Hammurabi, the first formal set of laws in history.”²² It is recognized both internationally and domestically that “one of the major, primordial functions of the law is to return the victims of an unjust act to their previous condition.”²³

“Effective remedy” means that by judicial action, monetary compensation or some other means any person whose rights have been unjustly violated will be restored as much as possible to their previous condition.

The right to effective remedy would be violated if, despite attempts to stop a proposed hydraulic fracturing operation using normal methods and channels, the operation continued.²⁴

Reasons for concern

- o If individuals or indigenous communities were to be adversely impacted by hydraulic fracturing practices, these articles would support their claims for effective remedy, redress or mitigation.

18. Right to compensation

Articulated in

In 1985 the U.N. General Assembly spelled out the nature of indemnification in the *Declaration of Basic Principles of Justice for Victims of Crime and Abuses of Power*. This declaration insists that “victims are entitled to prompt redress for the harm that they have suffered” and that offenders should “pay fair restitution to victims, their families and dependents.”²⁵

What this right entails

“The basic moral law of every society asserts that a government [or private entity] which wrongly injures its own citizens must make them whole insofar as this is possible.”²⁶

Reasons for concern

- o Personal or business economic losses associated with impacts of hydraulic fracturing practices would be an encroachment on this right.
- o Loss of property value attributable to impacts of hydraulic fracturing practices would be an encroachment on this right.
- o Any other losses that are measurable in or interpretable in economic terms would also be an encroachment on this right.

19. Right to know

Articulated in

The *Rio Declaration on Environment and Development* establishes citizens’ right to information about environmental toxics to which they may be exposed.

Rio Declaration Principle 10

“Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available.”

Aarhus Convention Article 1

“each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters....”

What this right entails

This is the right of citizens to be provided full information about environmental issues so they can participate knowledgeably in decision-making about those issues. It entails the right to full disclosure of information about ingredients, plans, planned effectiveness studies, Health Risk Assessments, Environmental Impact Reports, planned health effects monitoring, etc.

Reasons for concern

- o Despite manufacturers' claims that information about undisclosed ingredients should be considered proprietary, precedents are emerging around the country and the world in support of citizens' right to know the full list of chemical products, both inputs and outputs of fracking processes, to which they may be exposed.
- o The fact of chemical drift significantly exacerbates human rights concerns primarily because of the larger number of persons who are impacted by drifting chemicals and who may, because of their distance from the originating site, be uninformed, unwarned and perhaps unconsenting.

20. Right to participation in decision-making in environmental issues

Articulated in

Rio Declaration Principle 10

Aarhus Convention Article 1

(See #19 above)

UNDRIP Article 18

“Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.”

UNDRIP Article 23

“Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development.”

Reasons for concern

- o If individuals and indigenous communities have not had sufficient opportunity for effective participation in decision-making about programs which would impact them, their families and their lands, that would be an encroachment on this right.

21. Right to lands and resources

Articulated in

UNDRIP Article 26 (section two)

“Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.”

UNDRIP Article 32 (section one)

“Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.”

What this right entails

Indigenous peoples perceive and experience a unique, more integral and less “othered” relationship with their lands and physical environs than do most western cultures, and this specific “right to lands” is intended to reflect and protect that relationship.

Reasons for concern

- o If the surface or subsurface lands or resources owned by indigenous communities – including surface and ground waters, surface and subsurface biotic communities of all types, soils and subsurface ground structures – were to suffer damage or be in any way compromised as a result of fracking practices, that would be an encroachment on this right.

22. Right to equal protection of the law

Articulated in

CCPR Article 26

“All persons are equal before the law and are entitled without any discrimination to the equal protection of the law. In this respect, the law shall prohibit any discrimination and guarantee to all persons equal and effective protection against discrimination on any ground...”

UNDRIP Article 2

“Indigenous peoples and individuals are free and equal to all other peoples and individuals and have the right to be free from any kind of discrimination, in the exercise of their rights, in particular that based on their indigenous origin or identity.”

What this right entails

This means that discrimination against persons and classes is proscribed.

The basic principles of environmental justice require that those communities that are disadvantaged in any way – socially, economically, as a result of discriminatory racial policies, etc., or who simply have less ready access to social and economic resources – be accorded the same degree of respect, fair treatment and opportunity for meaningful involvement in decision-making as communities that are more socially or economically advantaged and have greater access to resources. As explained on the Environmental Protection Agency website, “Fair treatment means that no group of people, including

racial, ethnic, or socioeconomic groups, should bear a disproportionate share of...negative environmental consequences.”²⁷

Reasons for concern

- o Are all communities, whether rural or urban, treated equally regardless of perceived social privilege or socioeconomic status?
- o Does the socio-economic makeup of communities appear to be a factor in any decisions made about the proposed hydraulic fracturing program?
- o Are disadvantaged communities affected any differently than more privileged communities?
- o Are communities with different racial compositions affected differently?

23. Right to freedom from discrimination due to disability

Articulated in

The Americans With Disabilities Act (US)

UNDRIP Article 22 (section one)

“Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration.”

What this right entails

The US Department of Justice maintains a website with detailed information about ADA requirements.²⁸ In general, this law requires that everyone who has, or is perceived to have, a disability not be discriminated against in any way.

A booklet providing an overview of ADA “requirements for ensuring equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation” is available on the ADA website.²⁹

Reasons for concern

- o Discrimination occurs when any sub-group is disproportionately impacted by a policy or practice and no sufficient accommodations are made for them. Individuals with asthma or other respiratory conditions, chemically sensitive persons, pesticide sensitive persons, people with certain allergies, immunocompromised people, the elderly, the very young, pregnant women,³⁰ any place-bound persons (in hospitals or elder care facilities, for example), to name a few vulnerable sub-sets of residents, may be reasonably expected to experience more serious adverse effects from exposure to fracking operations than the general population.
- o Have reasonable accommodations been developed for persons in those groups to insure that they can avoid being unfairly impacted by fracking practices?

24. Right to prior, free and informed consent

Articulated in

UNDRIP Article 19

“States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and

informed consent before adopting and implementing legislative or administrative measures that may affect them.”

What this right entails

This is the right to a) be fully informed about hydraulic fracturing processes, input materials, output materials, anticipated effects on humans and the environment and anticipated impacts on the community; b) be allowed adequate time and opportunity to deliberate freely, as individuals and as communities; and c) give or withhold consent for the program.

Reasons for concern

- o Have indigenous communities been provided full information about the materials, processes and outcomes of hydraulic fracturing?
- o Have indigenous communities been given adequate time and opportunity, as individuals and as communities, to deliberate freely?
- o Have indigenous communities been given opportunity, before any decisions are made, to give or withhold formal consent for the fracking program?

25. Right of experimental subjects to free and informed consent

Articulated in

Nuremberg Code Item 1

“The voluntary consent of the human subject is absolutely essential.”

Nuremberg Code Item 9

“the human subject should be at liberty to bring the experiment to an end if he has reached the physical or mental state where continuation of the experiment seems to him to be impossible.”

What this right entails

This is the right to be fully informed about an experiment before agreeing to participate, the freedom to choose whether to participate or not, and the freedom to withdraw from the experiment at any time.

The rights of experimental subjects to informed consent and to protection from possible harms, as they are expressed in The Nuremberg Code, are premised on the acknowledgment that hydraulic fracturing practices and their impacts on exposed humans have not been adequately studied and are thus at least partly experimental in nature.

Reasons for concern

- o Have citizens been provided opportunity to give or refuse consent to exposure to the effects of fracking processes?
- o Have citizens been provided ways to withdraw themselves or their families from exposure to the effects of fracking processes if they choose not to be exposed?
- o Have citizens, particularly those with certain disabilities, been notified about details of the fracking program and provided alternative places to stay during fracking operations to reduce exposures?

26. Right of experimental subjects to be protected from injury, disability or death

Articulated in

Nuremberg Code Item 7

“Proper preparations should be made and adequate facilities provided to protect the experimental subject against even remote possibilities of injury, disability, or death.”

What this right entails

This is the right to be protected from anticipated, remote or unanticipated harms that may possibly result from participation in the experiment.

Reasons for concern

- o Have such protections been provided, particularly for those at increased risk of harm from exposure to the effects of fracking operations?

Potential Liabilities

Listed below are potential liabilities the New York State Department of Environmental Conservation may incur if plans to allow hydraulic fracturing in New York were to go forward.

1. The potential consequences of governments ignoring human rights norms are not insignificant. Loss of public confidence in agencies and their processes is not a small thing, even from the perspective of the agency, and even when viewed through the lens of basic practicality. When human rights standards are compromised and institutional trust is lost the consequences can be monumental, costly and long lasting.

Human rights abuses (sometimes committed unwittingly) in the US Public Health Service's infamous Tuskegee Syphilis Study (1932-72), and the debilitating consequences that have continued to compromise the effectiveness of public health work in African American communities ever since, are only one example of how failure to respect human rights standards can negatively impact the ability of government agencies to effectively do their work. Institutional trust is not high in communities impacted by fracking operations, and when lost could take decades to win back.

2. If the NYS DEC were to allow hydraulic fracturing, especially in close proximity to rural neighborhoods and family residences, there would be risk of a public and perhaps media perception that the NYS DEC does not respect human rights norms. There could also be a public recognition that despite awareness of links between fracking and health impacts, and despite awareness of human rights concerns, the NYS DEC did not move to eliminate or more strictly regulate fracking operations.
3. Greater involvement of human rights organizations such as Human Rights Watch and other human rights organizations.
4. One goal of human rights activism, often referred to as "the mobilization of shame," involves human rights organizations using tools such as video recording of actions considered to be human rights violations and of persons believed responsible for those actions; posting those videos publically; holding public, community-led, trial-like Citizens' Tribunals with independent judges who weigh, using human rights norms rather than civil law, the justness of a given situation; and public, community-led, Citizens' Inquiries which record and document oral and written testimony from affected community members presented to a panel of commissioners.

5. Potential economic risks include liability insurance carriers reconsidering their coverage, conditions and premiums for fracking operations near human populations.
6. Other economic and social risks include potentially costly legal actions brought against the NYS DEC for failure to adequately regulate fracking practices as a violation of human rights; possible legal action with respect to the Americans with Disabilities Act; and possible multiple small claims court actions for economic redress.
7. Potential litigation through the Inter-American Court of Human Rights, a court of the Organization of American States.

Measures to Reduce Liabilities

Before any plans to license hydraulic fracturing operations are agreed to, the New York State Department of Environmental Conservation should require:

1. a comprehensive study of human health impacts related to fracking operations. An October 5, 2011 letter to Governor Andrew Cuomo, signed by 250+ physicians and other health care professionals, requested such a study, and evidence accumulated so far indicates enough significant risk of adverse health effects that this recommendation deserves to be implemented. A study of the impacts of fracking on agriculture and local food production should be included as well.
2. maximum transparency about materials and processes for all aspects and phases of preparation, development, drilling and fracking operations, as well as full disclosure of all chemical inputs and outputs, including information drilling companies may wish to consider proprietary.
3. public notification of each new nearby drilling and fracking operation, broadly available at no charge and by multiple means – signage, email lists, websites, phone calls, etc. – especially for those persons in the area susceptible to, or concerned about, adverse health impacts.
4. assurances that no drilling or fracking operations, and no storage of any hazardous materials will occur on lands of the Onondaga Nation without the Nation's full participation in planning and decision-making, and only after their prior, fully informed and free consent has been obtained and documented.
5. full cost accounting, including costs for externalities such as impacts on local infrastructure, roads, social services, human and environmental health, etc., the results of which should be made public and easily accessible.
6. a comprehensive, systemic approach to hydrofracking water usage that tracks, records and makes publicly available every step of the process from withdrawal to disposal, including transport.
7. development of a high quality, information rich, broad-based communication strategy for providing ongoing, factual information, as unbiased as possible, about all aspects of all phases of development, drilling and fracking operations. Community members should be involved in the planning, development and operational phases of creating this

- system and the service should be provided by an independent third party.
8. implementation of health effects monitoring studies, preferably cohort studies, to be undertaken by the Department of Health or independent third parties. Active (rather than passive) surveillance methodologies should monitor for a range of adverse health effects, both acute and chronic, associated with exposure to fracking operations. Representatives from citizen groups should be actively involved in the design, planning, implementation and monitoring of these studies. They should be actively engaged partly because as members of the vulnerable community they have a right to be involved, partly because community members have access to a wide range of relevant local knowledge that outside researchers do not have access to, and partly because their involvement will help insure credibility and community buy-in for the studies' results.
 9. regular monitoring of ambient air quality, local ground and surface water quality, including local drinking water wells, for the chemicals used in and outputted from fracking processes, undertaken by the Department of Health, the Department of Environmental Conservation or independent third parties, with active citizen involvement in all phases. Noise and light pollution levels should also be monitored and made publicly available. Baseline levels should be established before operations begin. Results should be published regularly and made available in multiple, easily accessible formats.

In addition, if there is *prima facie* evidence that a well's water quality has been compromised by fracking operations, the burden of proof should be on the driller to prove their operations are not responsible, and not on the resident whose well has been contaminated.
 10. oversight by external observers, agreed to by the Governor's High Volume Hydraulic Fracturing Advisory Panel, representatives of the Onondaga Nation and local citizen environmental organizations, to monitor implementation of these studies.
 11. development and approval of plans for insuring that children, the elderly and other vulnerable populations, because of their greater biological vulnerability to environmental exposures, not be required to endure exposures from fracking operations.
 12. development and approval of plans for insuring that place-bound persons, such as disabled persons living in homes near fracking operations, those in daycare facilities, elder care facilities, hospitals, schools, etc., not be required to endure exposure to the effects of fracking operations if they wish not to.

13. development and approval of plans for alternative housing, transportation and services for those who, for reasons of health or health concerns, require that they and their family members not be exposed to the effects of fracking practices.

Conclusion

As noted in a recent United Nations General Assembly document, the environmental damage caused by hydraulic fracturing for natural gas poses “a new threat to human rights;”³¹ and a recent United Nations Resolution makes clear that “environmental damage can have negative implications, both direct and indirect, for the effective enjoyment of human rights.”³²

This report, in light of the principles expressed in those documents, provides the New York State Department of Environmental Conservation and Earthworks' Oil and Gas Accountability Project a list of formal human rights norms of concern associated with high volume hydraulic fracturing operations, outlines DEC's potential liabilities and describes measures that DEC can take to reduce those liabilities.

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<http://www.peoplesinquiry.co.nz>

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Additional Resources

The Center for Human Rights and the Environment is headquartered in Córdoba, Argentina. <http://www.cedha.org.ar>

The Global Network for the Study of Human Rights and the Environment is based at the University of the West of England in Bristol.

Information about the Inter-American Commission on Human Rights, the Inter-American Court on Human Rights (seated in San José, Costa Rica) and human rights instruments pertinent to American states can be found at <http://www1.umn.edu/humanrts/inter-americansystem.htm>

Endnotes

¹ Document A/HRC/18/NGO/91, "Hydraulic fracturing for natural gas: A new threat to human rights," distributed September 19, 2011.

² United Nations Resolution 16/11 "On Human Rights and the Environment," adopted by the United Nations Human Rights Council on March 24, 2011.

³ Steingraber, S, *Raising Elijah: Protecting Our Children in an Age of Environmental Crisis*, De Capo Press, 2011, pp 270-71.

⁴ Steingraber, S, *Raising Elijah: Protecting Our Children in an Age of Environmental Crisis*, De Capo Press, 2011, pp 270-71.

⁵ "When drilling through drinking water, there is no room for error. The drinking water that overlies the Marcellus Shale services 4 million people. Can the external surface of every well bore that pierces a water supply always be trusted to remain an unbreachable barrier to the substances flowing and down its interior surface? A single cracked well bore can bring eternal, irremediable ruin to groundwater. And if this happened, how would we know?" – Steingraber, S, *Raising Elijah: Protecting Our Children in an Age of Environmental Crisis*, De Capo Press, 2011, p 276.

⁶ Lupo PJ, Symanski E, Waller DK, Chan W, Langlois PH, Canfield MA, et al. 2011. "Maternal Exposure to Ambient Levels of Benzene and Neural Tube Defects among Offspring: Texas, 1999–2004." *Environmental Health Perspectives* 119:397-402.

⁷ "Fracking tests near Blackpool 'likely cause' of tremors," BBC news, November 2, 2011, <http://www.bbc.co.uk/news/uk-england-lancashire-15550458> (accessed November 8, 2011). A report commissioned by the energy firm Caudrilla, *Geo-mechanical Study Of Bowland Shale Seismicity*, concluded that fracking tests were the likely cause. The report, dated 2 November 2011, is available at: <http://preview.tinyurl.com/6z79e36> (accessed November 9, 2011).

Similar concerns about earthquakes triggered by fracking activity emerged with fracking operations in Arkansas. "Arkansas Earthquakes Decline After 'Fracking' Injection Well Closures," Huffington Post Green, April 11, 2011. http://www.huffingtonpost.com/2011/03/15/arkansas-earthquakes-2011-fracking_n_835868.html (accessed November 9, 2011)."

See also *Examination of Possibly Induced Seismicity from Hydraulic Fracturing in the Eola Field, Garvin County, Oklahoma*, Oklahoma Geological Survey, Open-File Report OF1--2011, August 2011, http://www.ogs.ou.edu/pubsscanned/openfile/OF1_2011.pdf (accessed 11-17-11).

⁸ Picolotti, Romina and Jorge Daniel Taillant, *Linking Human Rights and the Environment*, University of Arizona Press, 2003, p 123 (emphasis in original).

⁹ "With the exception of the right to self-determination, all the rights in the Universal Declaration and the Covenants are the rights of individuals. Enumerations of rights thus typically begin 'Every human being...', 'Every one has the right...', 'No one shall be...', 'Everyone is entitled....'" Jack Donnelly, Andrew Mellon Professor in the Graduate School of International Studies at the University of Denver, *Universal Human Rights in Theory and Practice*, Cornell University Press, 2002, p23.

¹⁰ Donnelly, *Universal Human Rights in Theory and Practice*, Cornell University Press, 2002, p8.

¹¹ "Human rights are minimal standards. They are concerned with avoiding the terrible rather than with achieving the best. Their focus is protecting minimally good lives for all people." James Nickel, "Human Rights" in the *Stanford Encyclopedia of Philosophy*, 2006. In addition, Article 43 of the *United Nations Declaration on the Rights of Indigenous Peoples* states that "The rights recognized herein constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world."

¹² Adopted by the UN General Assembly 13 September 2007. Since adoption the US and Canada have reversed their initial positions and now endorse the Declaration.

¹³ 1978

¹⁴ Rights enunciated in the 1947 *Nuremberg Code* are for the protection of individuals being studied in research protocols. If the case can be made that a population is being studied as

research subjects – e.g., that persons living and working in fracking zones are being studied for health effects resulting from exposure to the effects of fracking processes – then provisions of the *Nuremberg Code* would apply to individuals in that population.

¹⁵ Many of the rights listed below have been articulated in several different human rights declarations, conventions or charters, but for simplicity's sake this Report lists only one or two instruments for each right.

¹⁶ This passage continues: "It found that the determination of whether this violation had occurred in *Lopez-Ostra v. Spain* should be tested by striking a fair balance between the interest of the town's economic well-being and the applicant's effective enjoyment of her right to respect for her home and her private and family life. In doing this, the Court applied its "margin of appreciation" doctrine, allowing the State a "certain" discretion in determining the appropriate balance, but finding in this case that the margin of appreciation had been exceeded. It awarded Mrs Lopez-Ostra 4,000,000 pesetas [approximately US\$35,600], plus costs and attorneys' fees." Shelton, Dinah, "The Environmental Jurisprudence of International Human Rights Tribunals," in Picolotti, R and Taillant, JD, 2003, p 15.

¹⁷ See items 22 and 23 below on discrimination.

¹⁸ See items 22 and 23 below on discrimination.

¹⁹ Health Impact Assessment for Battlement Mesa, Garfield County Colorado, Colorado School of Public Health, September 2010

²⁰ Adopted by the General Assembly, 108th plenary meeting, July 28, 2010

²¹ *United Nations Declaration on the Rights of Indigenous Peoples*, Article 32 (section two)

²² Drinan, Robert F, *The Mobilization of Shame, A World View of Human Rights*. Yale University Press, 2001 p 186.

²³ Drinan RF. 2001. p 170.

²⁴ In reference to a specific case: "the human right to effective judicial remedy has been violated because despite the riverside communities' plea to the judicial system, nothing has been done to stop the contamination." in Picolotti, R and Taillant, JD, 2003, p 146.

²⁵ Drinan RF. 2001. p 171.

²⁶ Drinan RF. 2001. p 187.

²⁷ US EPA's definition of environmental justice. See

<http://www.epa.gov/compliance/resources/faqs/ej/index.html> Quoted in Robert D Bullard, *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, Sierra Club Books, San Francisco, 2005, p. 4.

²⁸ <http://www.usdoj.gov/crt/ada/>

²⁹ <http://www.usdoj.gov/crt/ada/publicat.htm#Anchor-ADA-44867>

³⁰ In this regard, see provisions in the *Convention on the Elimination of All Forms of Discrimination against Women*.

³¹ Document A/HRC/18/NGO/91, "Hydraulic fracturing for natural gas: A new threat to human rights," distributed September 19, 2011.

³² United Nations Resolution 16/11 "On Human Rights and the Environment," adopted by the United Nations Human Rights Council on March 24, 2011.