



**Amicus Brief to the Permanent People's Tribunal**  
*On Human Rights, Fracking, and Climate Change*

On the Issue of Human Rights Violations and Climate Change Inducing Invisible Methane, and Deadly Volatile Organic Compounds and other Pollutants emitted by the Oil and Gas Sector which can be identified with Infrared Technology

March 30, 2018

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**Summary:**

The following short amicus brief presents new technological advances that can identify invisible climate change causing fugitive methane as well as potentially deadly volatile organic compounds (VOCs) that are regularly emitted in the oil and gas sector, both at non-conventional and conventional oil and gas sites. While the presence of these substances is particularly dangerous to both the environment and to human health at nearly all facilities in developing and industrialized countries alike, what is perhaps of even greater concern is that many of the emissions from the sector are invisible to the human eye. A site can seem to the observer to be completely clean of emissions, when in fact, invisible methane and volatile organic compounds emissions are intense and pose severe threat to workers at the site as well as to the environment, to people and to communities nearby. Utilizing infrared technology existing in hand held cameras, recent work by a group of non-governmental organizations in the Americas, has revealed hundreds of sites where these emissions are occurring. Given that eliminating these emissions is both inexpensive and easily achieved, the revelation of this work shows clear responsibility of both corporations to cease the release of fugitive emissions and of governmental authorities to prohibit, control, correct, and ensure that they are not occurring. The violations of human rights impacts caused by these emissions are multiple, not limited to, the Right to Life, the Right to Health, the Right to a Healthy Environment, and the Right of Access to Information. Judiciaries can and should consider emergency measures and other orders to ensure that contamination at known sites where fugitive emissions are occurring cease and be repaired.

**Context:**

The increasing concern expressed around the world since the advent and spread of hydraulic fracturing (fracking) processes to extract shale gas and oil from extensive geological formations, has raised many red flags related to the numerous risks posed by these operations. The potential for land and water contamination caused by fracturing the earth and spreading toxic chemicals used in fracking is well known. What has received less attention are the severe impacts that fracking, as well

as other conventional oil and gas operations, are causing to air quality, and most concerning, that a large portion of the air pollutants emitted by the oil and gas sector are invisible to the naked eye.

Fugitive methane emissions are common throughout the process chain of oil and gas production, including in exploration, drilling, fracking, extraction, storage, processing, separation, compression and transportation. Methane is a short-lived climate pollutant gas that is many more times potent than CO<sub>2</sub> in its effect to induce global warming, and as such it is contributing to accelerate climate change at alarming rates. Other fugitive toxic compounds present in fracking as well as in oil and gas operations, include nitrous oxide, particulate matter, black carbon, CO<sub>2</sub>, benzene, ethyl benzene, and hydrogen sulfide. They are emitted either as a component of raw natural gas, or as a by-product of natural gas combustion. Some of these gases (most of them invisible), are known carcinogens and/or cause other serious health impacts such as respiratory diseases, rashes, eye irritation, nausea, birth defects, and many more. Many studies have revealed the presence of these toxins at oil and gas facilities around the world.

### **Health and other Impacts of these mostly invisible emissions:**

- *Benzene* has been linked to cancer, anemia, brain damage, and birth defects, and it is associated with respiratory tract irritation. Over time, benzene exposure can also lead to reproductive, developmental, blood, and neurological disorders. A 2012 study estimated a 10 in a million cancer risk--well over the US EPA's level of concern--for residents near a well pad, attributable primarily to benzene levels measured in the air near the well site. Benzene is a constituent of raw natural gas, so leaks and vents are the primary source of benzene pollution from the oil and gas industry.
- *Ethylbenzene* has been associated with respiratory and eye irritation, as well as blood and neurological disorders. Like benzene, ethylbenzene is a constituent of raw natural gas and leaks and vents of gas are the primary sources of ethylbenzene.
- *Hydrogen sulfide* gas is primarily found near wells producing "sour gas." At high concentrations, it can cause severe respiratory irritation and death. At lower levels, it can lead to eye, nose, and throat irritation; asthma attacks; headaches, dizziness, nausea, and difficulty breathing.
- The oil and gas industry dumps millions of tons of methane and other pollutants, like volatile organic compounds (VOCs) into our air each year.
- Pollutants from the oil and gas supply chain contribute to the formation of ozone smog pollution, which blankets many world cities in the warmer months.
- VOCs and methane, vented and leaked from the oil and gas supply chain, and nitrogen oxides (NO<sub>x</sub>), formed by gas flaring and engines at natural gas facilities, react together in the presence of sunlight to form ozone smog.
- Methane pollution from oil and gas facilities also worsens climate change, resulting in hotter weather and stagnant air. These warmer conditions in turn worsen ozone smog levels.
- This pollution harms the health of those that live near oil and gas well pads and other sites, but also people living hundreds or thousands of miles "downwind" because air pollution can readily travel those distances.
- When inhaled, ozone smog can impair lung function, trigger asthma attacks, and aggravate conditions of people with bronchitis and emphysema, in some cases leading to premature death.
- Children, the elderly, and people with existing respiratory conditions are the most at risk from ozone smog pollution, which can drive them to shelter indoors in the warmest months of the year when smog levels are highest, robbing children of their summers and others of their ability to work and play outdoors.
- Oil and gas operations, especially fracking, utilize dozens of diesel engines in the form of trucks, pumps and other devices.
- The pollution from these engines can be a major contributor of fine particle pollution.

- Fine particle pollution is shown to cause asthma attacks, other respiratory diseases, heart attacks and premature death.
- No study has yet been done to quantify the impacts but the amount of diesel engines on site is quite large especially during the fracking process.
- Without the controls on diesel engines that have been in place in the US for some time, particulate emissions from fracking engines would be very large and harmful.

### **Environmental Justice**

It is often the case that oil and gas operations are located in areas with low income or minority residents. This is because richer and more affluent communities are able to leverage their political and economic power to ensure that oil and gas operations are kept out of their residential area. Indigenous communities throughout the world suffer systematic discrimination and violation from oil and gas operations, not only of their universal human rights but also their specific rights as indigenous populations, including but not limited to rights to land, rights of consultation and participation in development planning.

Indigenous groups have also been wrongfully accused of hindering development, of violence against the industry and society, and have been illegally persecuted and prosecuted under legal systems that are complicit with industry and the public sector to favor oil and gas development above the rights and against the interests of local populations.

### **Technology to Identify and View Illegal and Toxic Emissions and Site Visits to Latin America:**

A new technology developed by FLIR (Forward Looking Infrared) placed in a hand held device that resembles a VHS Video Camera, enables the user to view invisible methane and other volatile toxic gases through a view finder. This technology is easily deployed to any fracked or conventional oil and gas site, and can be quickly utilized to ascertain the presence of fugitive emissions from any oil and gas facility.

The non-for-profit organization Earthworks has pioneered an effective methodology to utilize the FLIR technology at sites, which are thought to be negatively impacting nearby communities. They have visited hundreds of sites in the United States documenting toxic and illegal fugitive emissions from the oil and gas sector, and have assisted communities in presenting complaints to authorities, as well as pressuring oil and gas companies to correct these circumstances.



These two images show two hydrocarbon storage tanks in Mexico, at the same moment in time, one viewed with the naked eye, the other viewed with an the infrared FLIR technology. They are emitting methane and deadly volatile organic compounds.

In the images below, a trained technician and also a local community member utilize a FLIR camera to record emissions at oil and gas operations in Neuquén Argentina.



Earthworks, in a collaborative engagement with the Center for Human Rights and Environment and the Clean Air Task Force, have embarked on a series of field visits to Latin America, which has so far included Mexico and Argentina, to register fugitive emissions at conventional and non-conventional oil and gas sites. The visits have included workshops with local indigenous communities and non-governmental organizations to educate stakeholders on the severity of these emissions, the impacts they have on human health, on the local environment, and on climate change, and how this technology can be utilized in local campaigns and advocacy work. In the footnote line<sup>1</sup>, the reader can learn more about one of these visits (to Veracruz Mexico); more information will be available soon related to a visit to the *Vaca Muerta* shale play in Neuquén, Argentina.

### **Responsibility and Fixes from Industry and Government**

Corporations and governments can and should stop these unnecessary and potentially deadly emissions. Corporations know of these emissions, since in most cases, the design of holding tanks are such that they are expressly venting these gases into the air by choice. The industry is also aware of potential undesired leaks that may occur in pipe joints and other equipment throughout the production chain. Such leaks should be monitored and the proper equipment (such as a FLIR camera) should be employed regularly to check for undesired leaks.

Governments, meanwhile, generally are *not* controlling corporations to prevent such leaks. It is common that the governmental agencies responsible for oil and gas sector oversight, do not own or operate any leak detection technology, relying on the industry to self-regulate for potentially deadly fugitive emissions.

The emissions caused by fugitive gases are both easily repaired by capturing *and not venting* the gases, and channeling them to a safe separation and disposition unit. The emissions captured, in many cases, may also be commercially viable, further enabling this capture, and making corrections a profitable endeavor. Correctional options and policies are for example,

- To implement comprehensive and frequent Leak Detection and Repair (“LDAR”)
- Eliminating or minimizing venting
- Prioritizing gas capture and use; minimize flaring
- Requiring diesel engines to have pollution controls
- Monitoring, measuring, reporting, and verifying

Regardless of the emission source, there is almost always a cost-effective regulatory path to end this alarming situation that in many cases may have persisted already for many decades.

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<sup>1</sup> <http://center-hre.org/infrared-camara-reveals-toxic-gases-at-pemex-oil-and-gas-sites-in-mexico/>

### **Human Rights Violations:**

It is clear that fugitive methane and other volatile organic compound leaks from the oil and gas sector cause direct human right violations, including, but not limited to:

- The right to life (there have been several cases of sudden death of workers servicing tanks that were emitting large amounts of gas);
- The right to health, as such emissions cause numerous diseases, cancer, and other health impacts;
- The right to a healthy environment as such emissions are continuously impacting immediate surroundings and any life form that is downwind of emissions;
- The rights to information, of people and communities, that are unaware of the health and environmental risks due to these fugitive emissions;
- The rights of participation of communities living in the area of oil and gas operations, with regards to the placement and design of oil and gas sites to avoid these risks;

### **Provisional Measures and other Legal Mechanisms to Correct Fugitive Emissions from Oil/Gas Sector**

It is evident from the information described that fugitive methane and volatile organic compound emissions from the oil and gas sector imply dire emergency conditions that must be addressed immediately when identified, as they are both deadly and highly impacting for individuals and communities living near oil and gas sites and are extremely toxic for the local environment, in addition to contributing significantly to climate change.

Because the fix to such fugitive emissions is not only easily done, but also economically viable for corporations to repair, often times generating supplemental income rather than costs, it is paramount that these fixes be undertaken. It is also paramount for governments to enable themselves, acquire technology and training, to properly identify, monitor and take measures to force corporations to take necessary actions to correct these wrongs.

For this to occur the judiciary can take many actions to defend communities and force companies and governments to cease and correct contamination problems. Legal steps by the judiciary might include:

- emergency measures to cease operations immediately until contamination can be classified and quantified
- orders to install capturing, filtering, separation and disposition technologies
- orders to ensure that governmental agencies identify, monitor and force the industry to comply with existing regulations
- orders to collect health data in likely areas of impact, downwind or in the vicinity of oil and gas operations of sites found to be emitting toxic compounds