

## EARTHWORKS

### MEMO

**From:** Pete Dronkers, Certified Optical Gas Imaging Thermographer & Southwest Circuit Rider

**Subject:** Statement on FLIR video evidence featured in Dakota Resource Council report “Oil & Gas Pollution’s Impacts on North Dakota Families”

Between July 11th and July 13th, 2017, Earthworks traveled to Dunn and Williams counties, ND to investigate and document emissions from active oil and gas sites using a FLIR GF320 infrared camera. Working together with the Dakota Resource Council, we identified and visited 12 recently well sites in residential areas drilled in the last 2 years. I recorded visible and concerning emissions at [5 of these sites](#) near Williston and the Fort Berthold Reservation.

The FLIR GF320 is the oil and gas industry standard in leak detection and repair, and is utilized by state regulatory agencies across the country to monitor emissions from the oil and gas sector. This technology does not speciate or quantify pollutants, but it does make visible hydrocarbons and volatile organic compounds (VOCs) that are normally invisible to the naked eye. As an Infrared Training Center (ITC) certified OGI thermographer ([certification #86618](#)), my specific observations on the emissions seen in these videos can be found below.

#### **HRC Operating Fort Berthold 1H Well Site (Fort Berthold Reservation)**

Video: <https://youtu.be/cY3mfnZEd6o>

*Tank vapor emissions from a tank battery containing hydrocarbons. These emissions are an unknown blend of hydrocarbons and VOC's. There is likely a significant amount of methane.*

#### **HRC Operating Fort Berthold 8-12H Well Site (Fort Berthold Reservation)**

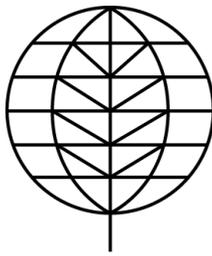
Video: <https://youtu.be/UEpah9g2JDc>

*Tank vapor emissions from a tank battery containing hydrocarbons. These emissions are an unknown blend of hydrocarbons and VOC's. There is likely a significant amount of methane.*

#### **HRC Operating Fort Berthold 13H Well Site (Fort Berthold Reservation)**

Video: <https://youtu.be/753lojkdVD0>

*Tank vapor emissions from a tank battery containing hydrocarbons. These emissions are an unknown blend of hydrocarbons and VOC's. There is likely a significant amount of methane.*



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### **Statoil & Gas LP Lougheed 2-11 XE #1TFH Well Site (Williston)**

Video: <https://youtu.be/o6ayGWItHCo>

*Emissions showing hydrocarbon exhaust from what is likely a large generator or other large engine. These emissions are likely low in methane but high in hydrocarbons and VOC's that escape complete combustion through the engine.*

### **Zavanna LLC Arrowhead 10-3 Well Site (Williston)**

Video: <https://youtu.be/bLT8CBytwAM>

*Tank vapor emissions from a tank battery containing hydrocarbons. These emissions are an unknown blend of hydrocarbons and VOC's. There is likely a significant amount of methane.*

**Independent laboratory (third party) testing confirms that the GasFindIR cameras can see the following gases at the minimum detected leak rate (MDLR):**

1-Pentene - 5.6g/hr	MEK - 3.5g/hr
Benzene - 3.5g/hr	Methane - 0.8g/hr
Butane - 0.4g/hr	Methanol - 3.8g/hr
Ethane - 0.6g/hr	MIBK - 2.1g/hr
Ethanol - 0.7g/hr	Octane - 1.2g/hr
Ethylbenzene - 1.5g/hr	Pentane - 3.0g/hr
Ethylene - 4.4g/hr	Propane - 0.4g/hr
Heptane - 1.8g/hr	Propylene - 2.9g/hr
Hexane - 1.7g/hr	Toluene - 3.8g/hr
Isoprene - 8.1g/hr	Xylene - 1.9g/hr

*For more information on the FLIR GF320 camera, please visit:*

<http://www.flir.co.uk/ogi/display/?id=55671>

*For more information on Earthworks' Community Empowerment Project, please visit*

<http://www.cep.earthworksaction.org>