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CHEMICALS USED IN OIL AND NATURAL GAS DEVELOPMENT AND DELIVERY
IN NEW MEXICO

Preliminary Analysis and Comments

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Introduction

This project was designed to explore the health effects of the products and chemicals used in drilling, fracturing (“frac’ing”), and recovery of oil and natural gas. It provides a glimpse at the pattern(s) of possible health hazards for those living in proximity to oil and gas development. In the process of researching the literature, we discovered that drilling companies have access to hundreds of products, the components of which are in many cases unavailable for public scrutiny. This spreadsheet addresses only those chemicals and products for which there is evidence that they are or have been used in New Mexico, and for which there were data about their health effects. We make no claim that this list is complete.

The products and chemicals included on this list were compiled from the Tier II reports sent to the state of New Mexico from Halliburton Energy Services, Inc., BJ Services Company, USA, and Schlumberger Technology Corporation. Information about the chemicals contained in the products listed on the Tier II reports, but not included in the reports, came from a variety of sources -- primarily MSDS sheets.

1. The four most common adverse health effects for the chemicals in the spreadsheet are skin/sense organ toxicity, respiratory problems, neurotoxicity, kidney and gastrointestinal/liver damage.
2. Several reasons led to the lack of data about the health effects of some of the products and chemicals on the spread sheet:
 - (a) We found no health effect data for a particular chemical or product.
 - (b) Some product labels have no ingredients listed.
 - (c) Some product labels provide only a general heading such as “plasticizer”, “cross-linker” etc.
 - (d) Some product labels state only “proprietary” or provide only the name of one or two ingredients plus “proprietary”.
3. The Tier II reports are very limited in the information they offer about the products listed. Only one chemical is provided for each product, and it is often not the most dangerous

ingredient. Many of the products contained multiple ingredients of varying degrees of toxicity, which is not indicated in the reports.

4. Of the 110 products on the spreadsheet, we could not find any information about the ingredients on 41 (37%), except for what was listed on the TIER II reports for their storage sites. Of these 41 products, 40 were from Halliburton.

5. Considering that information on 37% of the products was very limited, the following analysis of the health effects of the chemicals in the spreadsheet is likely to be an underestimation of the actual effects.

6. The following figures are based on the data in the Chemicals Used in Oil and Natural Gas Development and Delivery in New Mexico Spreadsheet. They are presented to define a pattern of the possible toxicity of the chemicals and products that are being used.

7. Of the 114 chemicals on the list:

- * 62% are skin/sensory organ toxicants
- * 61% are respiratory toxicants
- * 51% are gastro-intestinal/ liver toxicants
- * 35% are neurotoxicants
- * 35% are kidney toxicants
- * 34% are cardio/vascular/blood toxicants
- * 28% are reproductive toxicants
- * 25% are immune system toxicants
- * 25% are developmental toxicants
- * 21% are carcinogens
- * 20% are endocrine disruptors
- * 19% are wildlife toxicants
- * 15% result in other disorders
- * 11% cause mutations

Of the 30 (26%) of the chemicals on the list that are soluble, or miscible:

- * 93% are skin and sensory organ toxicants
- * 83% are respiratory toxicants
- * 83% are gastro-intestinal/liver toxicants
- * 63% are neurotoxicants
- * 60% are kidney toxicants
- * 57% are cardiovascular toxicants
- * 40% are immune system toxicants
- * 37% are reproductive toxicants
- * 37% result in other disorders
- * 33% are developmental toxicants
- * 30% are wildlife toxicants
- * 27% are endocrine disruptors
- * 27% cause mutations
- * 17% cause cancer

Of the 23 (20%) of the chemicals on the list that can vaporize:

- * 100% are skin and sensory organ toxicants
- * 91% are respiratory toxicants
- * 91% are gastro-intestinal/liver toxicants
- * 83% are neurotoxicants
- * 74% are kidney toxicants
- * 70% are cardiovascular/blood toxicants
- * 65% are reproductive toxicants
- * 65% are developmental toxicants
- * 39% are immune system toxicants
- * 39% are wildlife toxicants
- * 36% are carcinogens
- * 30% cause mutations
- * 30% are endocrine disruptors
- * 22% result in other disorders

Many of the chemicals on this list have been tested for lethality and acute toxicity. The majority have never been tested for low dose, long term effects that may not be expressed until long after exposure. Nor have adequate ecological studies been done. For example, most of the chemicals have not been tested for their effects on terrestrial wildlife or fish, birds, and invertebrates. It is reasonable to assume that the health endpoints listed above could very well be seen in wildlife, domestic animals, and pets.