



## Evaluation Report for Category B, Subcategory 3.12 Application

**Application Number:** 2015-3599  
**Application:** New End-Use Product Label –New Site  
**Product:** VigorOx Oil & Gas  
**Registration Number:** 32715  
**Active ingredients (a.i.):** Hydrogen Peroxide, Peroxyacetic Acid  
**PMRA Document Number:** 2700241

### Purpose of Application

The purpose of this application was to register the end-use product VigorOx Oil & Gas, containing the active ingredients hydrogen peroxide and peroxyacetic acid, for use as an antimicrobial within aqueous treatment fluids in subterranean oil and gas field well operations.

### Chemistry Assessment

VigorOx Oil & Gas is formulated as a solution containing hydrogen peroxide at a nominal concentration of 10% and peroxyacetic acid at a nominal concentration of 15%. This end-use product has a density of 1.13-1.15 g/cm<sup>3</sup> and pH of < 1. The required chemistry data for VigorOx Oil & Gas have been provided, reviewed and found to be acceptable.

### Health Assessments

There are no toxicological concerns for the end-use product.

Vigorox Oil & Gas will be supplied directly to aqueous treatment fluids through a closed mixed/loading and delivery transfer system. Due to its low pH (pH <1), VigorOx Oil & Gas is corrosive to both skin and eyes. Workers may be exposed to VigorOx Oil & Gas when connecting or replacing the bulk container totes to the transfer system, or during sampling of the treated water for titrating or performing analyses. Occupational exposure to VigorOx Oil & Gas is expected to be low if the precautionary statements and recommended personal protective equipment on the product label, which are intended to minimize worker exposure, are observed. Bystander exposure is likely to be low based on the use site.

A dietary exposure assessment was not required for this application.

## **Environmental Assessment**

Concentrations of peroxyacetic acid and hydrogen peroxide in waste fluids from use in oil and gas operations are expected to be low, breakdown quickly in aquatic and terrestrial environments, and are not expected to accumulate in organisms. This is in part due to the fact that peroxyacetic acid and hydrogen peroxide are relatively unstable in water as a result of hydrolytic reactions, spontaneous degradation and potential microbial breakdown. The transformation products of peroxyacetic acid and hydrogen peroxide are not of toxicological concern to the environment. As such, VigorOx Oil & Gas used in on-shore oil and gas field operations is not expected to pose a concern to the environment. Peroxyacetic acid (< 1 mg/L) has demonstrated toxicity to aquatic organisms and, therefore, a precautionary label statement informing users of the potential for toxicity to aquatic organisms is required on the product label.

## **Value Assessment**

Laboratory trials evaluating biocide performance against aerobic bacteria, acid-producing bacteria and sulfate-reducing bacteria were provided for the fracturing fluid and water flooding uses in support of the end-use product, VigorOx Oil & Gas. The fracturing fluid study also examined the ability of VigorOx Oil & Gas to prevent the formation of biofilm. The product was found to be effective in controlling slime-forming microorganisms at rates between 30 and 350 ppm peroxyacetic acid. Therefore, VigorOx Oil & Gas has been found to have acceptable value as a biocide in oilfield fracturing fluids and water flooding operations.

## **Conclusion**

The Pest Management Regulatory Agency has completed an assessment of the information provided and has found the information sufficient to support registration of VigorOx Oil & Gas.

## References

| <b>PMRA Document Number</b> | <b>Reference</b>  |
|-----------------------------|---|
| 2266576                     | 2012, Part 3.5.10: Storage Stability and Part 3.5.14: Corrosion Characteristics, DACO: 3.5.10, 3.5.14   |
| 2556039                     | 2015, Value and Efficacy Summary, DACO: 10.1, 10.2  |
| 2556040                     | 2010, Evaluation of Biocides for Microbiological Control Against Planktonic and Sessile Bacteria, DACO: 10.2  |
| 2691871                     | 2012, Evaluation of the Efficacy of VigorOx Oil and Gas at 30-200 ppm peracetic acid, DACO: 10.2.3  |
| 2691875                     | 2012, X-Chem Fayetteville produced water sample chemistry before and after dosing with peracetic acid, DACO: 10.2.3   |
| 2691877                     | 2012, Evaluation of the Antimicrobial Efficacy of VigorOx Oil and Gas at 100-350 ppm peracetic acid in produced water samples, DACO: 10.2.3   |
| 2266540                     | 2012, Part 8 – Environmental Chemistry and Fate, DACO: 8.1, 8.2.2.1, 8.2.2.2, 8.2.2.3, 8.2.3.1, 8.2.3.2, 8.2.3.3.2, 8.2.3.3.3, 8.2.3.4.2, 8.2.3.5.2, 8.2.3.5.4, 8.2.3.5.5, 8.2.3.5.6, 8.2.4.1, 8.2.4.2, 8.2.4.5, 8.2.4.6, 8.3.1, 8.3.3.1, 8.3.3.2, 8.3.4, 8.4.1, 8.5.1  |
| 2266544                     | 2012, Part 9 – Environmental Toxicology, DACO: 9.1, 9.3.1, 9.3.2, 9.4.1, 9.4.2, 9.4.3, 9.4.4, 9.4.5, 9.4.6, 9.4.7, 9.4.8, 9.5.1, 9.5.2.1, 9.5.2.2, 9.5.2.3, 9.5.2.4, 9.5.2.4.1, 9.5.3, 9.5.3.1, 9.5.3.2, 9.5.4, 9.5.5, 9.5.6, 9.6.1, 9.6.2.1, 9.6.2.2, 9.6.2.3, 9.6.2.4, 9.6.2.5, 9.6.2.6, 9.6.3.1, 9.6.3.2, 9.6.3.3, 9.6.4, 9.6.5, 9.6.6, 9.7.1, 9.7.2, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.6, 9.8.7, 9.9 |

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