NOTICE TO OPERATORS
NTO 2022-04

August 26, 2022

MECHANICAL INTEGRITY TESTING (MIT) PART 2 COMPLIANCE FOR STEAM INJECTION WELLS

The California Geologic Energy Management Division (CalGEM) is issuing this notice to inform operators that CalGEM has determined that Xenon-133 (an inert gas tracer) may be used as an alternative to Krypton-85 for purposes of completing a radioactive tracer survey that satisfies the Mechanical Integrity Testing (MIT) Part 2 requirements for steam injection wells. (Cal. Code Regs., tit. 14, § 1724.10.2.)

In response to concerns raised by multiple operators regarding supply constraints presently affecting the availability of Krypton-85 due to international sanctions related to Russian-Ukraine War, CalGEM evaluated the use of Sodium iodide, Methyl iodide, Ethyl iodide, and Xenon-133 as potential alternatives to Krypton-85 for radioactive tracer testing in steam injection wells.

CalGEM's review identified studies demonstrating that the use of Sodium iodide, Methyl iodide, and Ethyl iodide as tracers for the evaluation of steamflood wells leads to inaccurate or inconclusive results. The radioactive iodide tracers tend to decompose into water-soluble components at downhole conditions, with the tracers preferentially following the liquid phase rather than the vapor phase. Such a problem can be minimized when radioactive inert gas tracers are used. Such tracers are stable at steam conditions and have been shown to be reliable vapor-phase tracers. Consequently, only radioactive tracer surveys using inert gas tracers will be acceptable for demonstrating the mechanical integrity of steam injection wells in satisfaction of the MIT Part 2 requirements.

Based on review of laboratory evaluation of the properties and performance of Xenon-133 in detecting well integrity issues, CalGEM has determined that Xenon-133 as an inert gas tracer in a radioactive tracer survey can be a suitable option for satisfying MIT Part 2 requirements.

As specified in existing regulatory provisions, to confirm maintenance of well integrity, CalGEM may require operators to perform additional or different testing methods or frequencies beyond the default regulatory requirements. (Cal. Code Regs., tit. 14, §§ 1724.10.2, subds. (b)(6) & (c).) This may include a requirement to conduct testing for MIT Part 2 compliance more frequently than the default frequency specified in the regulation. For MIT Part 2 compliance that involves using a Xenon-133 radioactive tracer survey, determinations regarding whether such additional or different methods and frequencies may be appropriate will be informed by well-specific considerations and observations from field data pertaining to the use of Xenon-133 as those data become available.

If testing for MIT Part 2 compliance is performed using a Xenon-133 radioactive tracer survey and the test is inconclusive, CalGEM may require re-running the test or using an alternative testing method to satisfy the regulatory requirement. Potential alternative testing methods may include:

- Running a radioactive tracer survey with Krypton-85, if available.
- Running a temperature log survey.
    - Successful use of the temperature log survey option will require a sufficiently long shut-in duration and pulling the tubing.

Please be advised to best ensure efficient regulatory compliance, before running a test on a well to satisfy MIT Part 2 requirements, it is important to obtain written confirmation from CalGEM that the contemplated testing method is suitable for use with the specific well in question. (Cal. Code Regs., tit. 14, § 1724.10.2, subd. (a).). Operators with existing CalGEM approvals for radioactive tracer survey to satisfy MIT Part 2 testing requirements for steam injection wells may immediately start using Xenon-133 as an inert gas tracer. CalGEM will issue updated approval letters for the radioactive tracer survey with Krypton-85 and Xenon-133 as an inert gas tracers to satisfy MIT Part 2 testing requirements.

For general information on CalGEM's Underground Injection Control program, go to: https://www.conservation.ca.gov/calgem/general_information/Pages/UICApplicationGuidance.aspx

For detailed questions on the Underground Injection Control (UIC) program, please contact your CalGEM District representative.

Sincerely,

Uduak-Joe Ntuk
State Oil and Gas Supervisor