

# **REQUIREMENTS FOR UNDERGROUND GAS STORAGE PROJECTS**

## **NOTICE OF REQUEST FOR READOPTION OF EMERGENCY RULEMAKING ACTION**

### **REGARDING**

#### **TITLE 14. NATURAL RESOURCES DIVISION 2. DEPARTMENT OF CONSERVATION CHAPTER 4. DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES SUBCHAPTER 1. ONSHORE WELL REGULATIONS**

Notice Published July 14, 2015

**NOTICE IS HEREBY GIVEN** that the California Department of Conservation (Department) will be requesting readoption of emergency regulations necessary to protect public health, safety and the environment. The readoption will ensure the immediate and ongoing implementation of protective standards for all underground gas storage projects in the state while the Department continues the process of adopting permanent regulations for such projects. These emergency regulations were originally approved by the Office of Administrative Law (OAL) and became effective on February 5, 2016. (OAL File No. 2016-0126-03E.) This action is being taken in accordance with Government Code sections 11346.1 and 11349.6 of the California Administrative Procedure Act. **These regulations will be submitted to OAL on July 22, 2016.**

### **DILIGENT ADOPTION OF PERMANENT REGULATIONS**

As required for readoption of emergency regulations, the Department has made substantial progress and is proceeding with diligence to comply with Government Code section 11346.1, subdivision (e). (Cal. Code Regs., title 1, section 52(b)(1).) The following action demonstrate the Department's progress toward the adoption of permanent regulations:

- From February 17, 2016 through March 18, 2016 the Department opened an informal public comment period to outline the Division of Oil, Gas, and Geothermal Resources' (Division) immediate regulatory goals regarding underground gas storage, and to solicit specific input on how best to accomplish those goals.

- The Department received dozens of comment letters and emails, and hundreds of specified comments that were considered when drafting pre-rulemaking draft regulations (discussion draft regulations).
- On July 8, 2016 the Department publically released discussion draft regulations for the purpose of receiving additional public input on proposed regulatory text.
- A public comment period regarding the discussion draft regulations was noticed on July 8, 2016 and will end on August 22, 2016.
- The Department will conduct workshops in Sacramento, CA, on August 8, 2016, and in Los Angeles, CA, on August 11, 2016.

A readoption of the emergency regulations will ensure that performance standards necessary to protect against a present threat to public health, safety and the environment, remain in effect while the Department works to complete the regular rulemaking process for permanent regulations.

As required for readoption of emergency regulations, there have been no material changes in emergency circumstances since the original emergency adoption of these regulations.<sup>1</sup> (Cal. Code Regs., title 1, section 52(b)(2).)

The Department hereby incorporates by reference the rulemaking record OAL file number 2016-0126-03E.

### **PUBLIC COMMENT**

If you wish to comment on the proposed readoption of the emergency regulations, you must submit the comment directly to OAL within five calendar days of OAL's posting of the proposed readoption on the OAL website. You may submit comments on the proposed readoption to:

---

<sup>1</sup> The emergency regulations were originally noticed before the Aliso Canyon natural gas leak was stopped. That the leak has since been stopped does not represent a material change in emergency circumstances, however. Rather than address the Aliso Canyon natural gas leak specifically, the emergency regulations are necessary to immediately ensure that all operators of underground gas storage facilities in California are properly mitigating risks associated with their facilities. The Finding of Emergency, below, has been revised slightly to indicate that the Aliso Canyon natural gas leak is no longer uncontrolled.

Mail:

OAL Reference Attorney  
300 Capitol Mall, Suite 1250  
Sacramento, California 95814

Fax:  
(916) 323-6826

E-mail:  
[staff@oal.ca.gov](mailto:staff@oal.ca.gov)

When you submit a comment to OAL, you must also submit a copy of your comment to the Department:

Mail:  
Department of Conservation  
801 K Street, MS 24-02  
Sacramento, CA 95814  
ATTN: Gas Storage Facility Regulations Readoption

Fax:  
(916) 324-0948

E-mail: [DOGGR\\_GasStorageRegs@conservation.ca.gov](mailto:DOGGR_GasStorageRegs@conservation.ca.gov)

OAL will confirm that the Department has received the comment before considering it. Pursuant to California Code of Regulations, title 1, section 55, subdivision (b)(1) through (4), the comment must state that it is about an emergency regulation currently under OAL review, and include the topic of the emergency.

Adoption of emergency regulations does not require response to submitted comments. Any response to comments from the Department will be submitted to OAL within eight calendar days following the date of submission of the proposed emergency regulation to OAL, unless specific exceptions are applicable.

### **FINDING OF EMERGENCY**

Government Code section 11346.1, subdivision (b), allows a state agency to adopt emergency regulations if the agency makes a finding that the adoption of a regulation is necessary to address a situation calling for immediate action to avoid serious harm to the

public peace, health, safety, or general welfare. The Department of Conservation finds that emergency adoption of the regulations proposed herein regarding underground gas storage facilities is necessary for immediate preservation of the public peace, health, safety, or general welfare.

Basis for the Finding of Emergency:

- On October 23, 2015, a natural gas leak was discovered from a well used for injection and production of gas in the Aliso Canyon Natural Gas Storage Facility in Los Angeles County. The leak represents a significant threat to the public peace, health, safety and general welfare. The leak forced the relocation of thousands of people from the nearby community, and many residents reported adverse physical symptoms. The leaking gas is also highly flammable, posing an additional danger to public health and safety should the leaking gas ignite.
- The Aliso Canyon natural gas leak caused significant harm to the environment, as major amounts of methane, a powerful greenhouse gas, were emitted into the atmosphere.
- Despite efforts to stop the Aliso Canyon natural gas leak, many undertaken with consultation from industry and subject matter experts, the leak was not stopped until February 17, 2016 (nearly four months after it began). The leak commanded daily concentration and substantial resources from seven state agencies including the Division of Oil, Gas and Geothermal Resources, the California Public Utilities Commission, the California Air Resources Board, the California Energy Commission, the Division of Occupational Safety and Health, the Office of Environmental Health Hazard Assessment, and the Governor's Office of Emergency Services, as well as various local public health and safety agencies.
- Underground gas storage facilities inject gas into large underground reservoirs for storage before later withdrawing the gas for sale during peak load periods. Currently, the Division regulates fourteen active gas storage facilities in twelve separate fields across the state. Each of those projects may contain dozens of active gas storage wells. Many of these gas storage projects and wells are near residential areas or neighborhoods, similar to the Aliso Canyon Natural Gas Storage Facility.
- The severity of the Aliso Canyon natural gas leak and the prolonged failure of efforts to control it demonstrated the serious risks associated with underground gas storage facilities and the critical need for operators of all such facilities to immediately and proactively take all possible steps to identify and mitigate risks associated with operating a natural gas storage facility.

- On January 6, 2016, Governor Edmund G. Brown issued an emergency proclamation in response to the Aliso Canyon natural gas leak. The Governor's emergency proclamation directs the Division of Oil, Gas and Geothermal Resources (Division) to promulgate emergency regulations imposing safety and reliability standards for all underground gas storage facilities in California. The Governor's emergency proclamation includes a mandate that the emergency regulations accomplish all of the following:
  - Require at least a daily inspection of gas storage well heads, using gas leak detection technology such as infrared imaging.
  - Require ongoing verification of the mechanical integrity of all gas storage wells.
  - Require ongoing measurement of annular gas pressure or annular gas flow within wells.
  - Require regular testing of all safety valves used in wells.
  - Establish minimum and maximum pressure limits for each gas storage facility in the state.
  - Require each storage facility to establish a comprehensive risk management plan that evaluates and prepares for risks at each facility, including corrosion potential of pipes and equipment.
- Consistent with the mandate of the Governor's emergency proclamation, the Division finds that there is an immediate need to require implementation of performance standards specifically designed to ensure that operators of underground gas storage facilities are properly mitigating risks and taking all appropriate steps to prevent uncontrolled releases, blowouts, and other infrastructure-related accidents. The operation of existing underground gas storage facilities without the immediate implementation of such standards presents a direct and ongoing threat to public health, safety, and the environment. Although some operators may already be implementing these standards, the emergency regulations described in this notice will ensure that the standards are clearly stated and universally implemented at all underground gas storage facilities in California.
- In particular, the emergency regulations will ensure that operators of existing underground gas storage facilities monitor for indications of leaks in well casing and report anomalous detections to the Division, function test all safety valve systems, perform inspections of wellheads and surrounding area and equipment using effective leak detection technology, develop risk management plans that require verification of mechanical integrity and corrosion assessment and

monitoring, and provide the Division with complete project data and risk assessment results. Immediate implementation of these standards will provide the greatest possible assurance that underground gas storage facilities are safely operated and that an incident such as the gas leak at the Aliso Canyon Natural Gas Storage Facility does not recur.

For these reasons, pursuant to Government Code section 11346.1, subdivision (b), the Department hereby finds that adoption of the proposed regulation is necessary to address an emergency.

### **AUTHORITY AND REFERENCE**

Pursuant to the authority vested by sections 3013 of the Public Resources Code, and to implement, interpret, or make specific sections 3106, 3220 and 3403.5 of the Public Resources Code, the Department is proposing amendments to section 1724.9 of Subchapter 1 of Chapter 4 of Division 2 of Title 14 of the California Code of Regulations.

### **INFORMATIVE DIGEST / POLICY STATEMENT**

#### **Existing Law**

The Division supervises the drilling, operation, maintenance, and plugging and abandonment of onshore and offshore oil, gas, and geothermal wells. The Division carries out its regulatory authority to encourage the wise development of oil and gas resources, while preventing damage to life, health, property, and natural resources. (See Pub. Resources Code, § 3106.) Among the injection wells the Division regulates are those that inject fluids or gas into large underground reservoirs for storage before the gas is later withdrawn for sale during peak load periods. The Division is required to maintain surveillance over these facilities to ensure that the original reserves are not lost, that drilling of new wells is conducted properly, and that no damage occurs to the environment by reason of injection and withdrawal of gas. (Pub. Resources Code, § 3403.5.)

Written approval from the Division is required before any subsurface injection associated with underground gas storage can begin. (Cal. Code Regs., tit.14, §§ 1714, 1724.6.) The Division's regulations at Title 14, Division 2, Chapter 4 of the California Code of Regulations contain specific requirements that an applicant must satisfy before the Division will approve a subsurface injection project. These requirements include submission of engineering studies (including reservoir characteristics and casing diagrams), geologic studies (including structural contour and isopachous maps), and injection plans (including identification of the proposed maximum anticipated surface injection pressure and proposed monitoring system or methods to ensure no damage is occurring). (Cal. Code Regs., tit. 14, § 1724.7.) For underground gas storage projects, the applicant must also submit additional information about the proposed storage reservoir, a list of proposed surface and subsurface safety devices and measures to

ensure the safety of the project, and the proposed waste water disposal method. (Cal. Code Regs., tit. 14, § 1724.9.)

Approved injection projects are subject to additional filing, notification, operating and testing requirements throughout their operational lifespan. (See Cal. Code Regs., tit. 14, § 1724.10.) Among other requirements, Division regulations provide that all piping, valves and facilities shall meet or exceed design standards for the maximum anticipated injection pressure, and shall be maintained in a safe and leak-free condition. (Cal. Code Regs., tit. 14, § 1724.10, subd. (f).) Accurate operating pressure gauges or recording devices must be available at all times, and wells must be equipped for installation and operation of such devices. (Cal. Code Regs., tit. 14, § 1724.10, subd. (e).) Additionally, the operator must perform tests to establish the maximum allowable surface injection pressure and mechanical integrity of the well, and maintain data to establish that no damage to life, health, property or natural resources is occurring by reason of the injection project. (Cal. Code Regs., tit. 14, § 1724.10, subds. (h), (i) and (j).)

### **Objectives and Benefits of the Emergency Regulations**

The emergency regulations described in this notice would amend section 1724.9 of Title 14 of the California Code of Regulations to require compliance with performance standards for underground gas storage facilities. The emergency regulations would express these performance standards in more specific and definite terms than the existing regulations, ensuring that they are universally required and implemented at all underground gas storage facilities in California. In broad terms, the objective of the emergency regulations – on both a provision-specific level and as a whole – is to protect public health, public safety, and the environment from the inherent risks associated with underground gas storage facilities.

The emergency regulations respond to an immediate need to ensure that all gas storage facilities are currently undertaking all appropriate actions to protect against uncontrolled gas releases, blowouts, and other infrastructure-related accidents such as that experienced at the Aliso Canyon Natural Gas Storage Facility. The emergency regulations are also necessary to meet the six specific mandates of Governor Brown's emergency proclamation in response to the Aliso Canyon gas leak. The specific objectives and anticipated benefits of the emergency regulations are as follows:

- **Require Complete Project Data.** The emergency regulations would require operators of underground gas storage facilities to provide the Division with complete data regarding the geologic characteristics of the storage reservoir for all gas storage projects, including existing projects. The regulations would also expressly require data supporting the storage project to include specification of the bases for establishing maximum and minimum reservoir pressure limits. This provision would enable the Division to obtain valuable information, which the Division could use to evaluate project-specific operational conditions such as pressure limits (described

below). The added information would also help the Division and others respond more effectively in emergency situations. To the extent that additional project data is needed for existing gas storage projects, the regulation would require that the data be submitted as soon as practicable. The Division anticipates that the amount of time it will take to address incomplete project data will vary widely depending on the type of data that are needed. While some of the requirements of section 1724.7 and the proposed section 1724.9(a) could be quickly addressed, other requirements, such as the requirements for an engineering study under section 1724.7(a), could require a longer iterative process of data submissions to address. Operators will be required to diligently address any issues with incomplete project data.

- *Pressure Limits.* The emergency regulations would require the Division to impose minimum and maximum reservoir pressure limits on a project-specific basis, and would prohibit injection beyond pressure limits. Pressure is a critical factor in the safe operation of underground gas storage facilities. Failure to set and observe appropriate pressure limits causes unjustified risks to health, safety and the environment. This performance standard would mitigate those risks by ensuring that injection occurs at safe and appropriate pressures.
- *Monitoring for Annular Gas.* The emergency regulations would require operators to monitor wells that are part of an underground storage project for the presence of gas in the annuli of the well casings by monitoring annular pressure and annular gas flow in the well. Ongoing compliance with this performance standard would be required soon after the effective date of the emergency regulations, following an appropriate but brief grace period to allow for the readiness of monitoring systems. Because fluctuations in annular pressure or annular gas flow can signify a defect in the well casing or other subsurface well installation, compliance with this performance standard would help ensure early detection and appropriate responses to potential risks before they develop into a larger danger to health, safety and the environment.
- *Valve Testing.* The emergency regulations would require function testing of all surface and subsurface safety valve systems, master valves, and pipeline isolation valves. Testing of all valves would be required following an appropriate but brief grace period to allow for the readiness of testing systems and protocols, and thereafter at an appropriate regular interval. Valves help safeguard against uncontrolled gas releases and blowouts, and in some cases, defective valves can cause or exacerbate risks. Mandatory testing of valves at regular intervals would help ensure that these important components of gas storage infrastructure are maintained in good working order and able to perform as expected. Compliance with this performance standard would help prevent accidents at gas storage facilities, and ensure that valves will effectively control gas flow as needed.
- *Inspections of Wellhead Assembly and Attached Pipelines.* The emergency regulations would require operators to inspect the wellhead assembly and attached



pipelines for each well used in the gas storage project. Operators would be required to conduct ongoing inspections and use effective leak detection technology such as infrared imaging. This performance standard would help prevent accidents at gas storage facilities with early discovery of leaks or other irregularities in the wellhead assembly and attached pipelines. Early detection enables operators and regulators to take appropriate responsive action before potential risks develop into a larger danger to health, safety and the environment.

- *Risk Management Plans*. The emergency regulations would require operators to develop comprehensive Risk Management Plans within an appropriate time after the effective date of the emergency regulations. The plans, which would be subject to Division approval and routinely updated, would address data collection, hazard identification, risk analyses, preventative and monitoring processes to reduce risks, and periodic reassessment procedures. Operators would be expressly required to include protocols for ongoing verification of mechanical integrity of the wells within the gas storage facility (other than reliance on meeting the mechanical integrity testing requirements of section 1724.10, subdivision (j), of Title 14 of the California Code of Regulations), corrosion monitoring and corrosion risk assessments, ongoing verification of reservoir integrity, and specific identification of potential threats and hazards associated with the project.

This requirement would compel all operators of underground gas storage facilities to undertake a holistic, project-scale risk assessment of their operations. The plan protocols would also serve the benefit of reducing risks to health, safety and the environment by requiring operators to verify the mechanical integrity of their wells, reservoir, and other facility installations on an ongoing basis. It is anticipated that the Risk Management Plans would facilitate more effective oversight of operations and implementation of targeted prevention measures, thereby reducing risks and decreasing the overall chances of unmitigated infrastructure-related accidents.

### **CONSISTENCY WITH FEDERAL REGULATION OR STATUTE**

The proposed regulations do not differ substantially from existing federal regulations or statutes concerning underground gas storage facilities, though, as applied to certain pipelines and associated facilities, they may overlap with federal standards. The federal government establishes minimum pipeline safety standards under 49 Code of Federal Regulations parts 190-199. The federal pipeline safety laws allow for states to assume authority over intrastate gas and hazardous liquid pipelines through certifications and agreements with the Pipeline and Hazardous Materials Safety Administration (PHMSA). States must adopt the minimum pipeline safety regulations, but may adopt more stringent regulations of their own as long as they are not incompatible with the federal regulations. In California, the California Public Utilities Commission (CPUC) is responsible for enforcing the federal safety standards for intrastate gas pipelines, while the California

Office of the State Fire Marshal (OSFM) is responsible for enforcing standards for hazardous liquid pipelines. The Division's regulatory jurisdiction, which includes tanks and pipelines "attendant to" oil and gas production, may in some instances overlap that of both CPUC and OSFM.

While the performance standards set forth in the emergency regulations for gas storage facilities would apply to pipelines and associated facilities already subject to minimum federal safety standards, the requirements of the emergency regulations do not differ substantially from the federal requirements. Rather, the federal requirements for pipelines are generally similar to the emergency regulation standards for gas storage facilities. (See, e.g., 49 C.F.R. Part 192 [including requirements related to corrosion control, pipeline operational pressure, leak inspection, and a procedural manual for operations, maintenance and emergencies].) Additionally, the emergency regulations provide that an operator's demonstrated compliance with a specific requirement of the federal pipeline safety laws (including requirements CPUC and OSFM are responsible for enforcing) will satisfy the requirement of the emergency regulation to the extent the requirements are overlapping or duplicative.

### **CONSISTENCY WITH EXSITING STATE REGULATIONS**

The Division has determined that the proposed regulations are not inconsistent or incompatible with existing state regulations. The Division is not aware of any existing state regulations, other than those discussed in this notice, imposing standards for underground gas storage facilities specifically. To the extent other state agencies may enforce health, safety, or environmental protection standards that could apply to underground gas storage facilities because they are regulations of general application affecting a wider range of industrial activities, those regulations are not expected to be inconsistent or incompatible with the proposed regulations announced here. The proposed regulations would establish performance standards specific to underground gas storage facilities, and would only complement any existing rules of more general application. Pipeline safety standards enforced by the CPUC and OSFM are addressed in the discussion of federal law, above.

### **LOCAL MANDATE**

This proposal does not impose a mandate on local agencies or school districts.

### **COST OR SAVINGS TO STATE AGENCIES**

Costs or Savings to State Agencies: The Department estimates that implementation of the proposed emergency regulations would result in a need for eleven personnel years (PYs), with an approximate cost of \$1.96 million during the first twelve months, and \$1.81 million annually thereafter. If the Department re-directs current Division staff to implement the emergency requirements during the three months that the readoption allows, the Department anticipates costs of approximately \$416,000, which would be absorbed within

the existing budget for the current fiscal year. The Department does not anticipate costs or savings to other state agencies.

Non-Discretionary Costs or Savings to Local Agencies, Including Costs to any Local Agency or School District Requiring Reimbursement Pursuant to Section 17500 et seq.: None. This emergency rulemaking will not result in any costs or savings to local agencies.

Cost or Savings in Federal Funding to the State: This emergency rulemaking does not directly affect federal funding to the state.

### **DOCUMENTS RELIED UPON**

The Department relied upon the following documents in proposing this rulemaking action:

- Emergency Proclamation of Governor Edmund G. Brown, January 1, 2016, available at, <https://www.gov.ca.gov/news.php?id=19263>.
- American Petroleum Institute Recommended Practice 1171, Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs.

### **AVAILABILITY OF DOCUMENTS ON THE INTERNET**

The proposed regulatory language for the emergency regulations can be accessed through our website at: <http://www.conservation.ca.gov>.

If you have any questions regarding the process of the proposed emergency action, please contact Tim Shular, Office of Governmental and Environmental Relations at (916) 322-3080, or by email at [DOGGR\\_GasStorageRegs@conservation.ca.gov](mailto:DOGGR_GasStorageRegs@conservation.ca.gov).