
California Underground Facilities Safe Excavation Board

May 9-10, 2022

Agenda Item No. 14 Information Item – Staff Report

Abandoned Lines Standards Development Update

PRESENTERS

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SUMMARY

Abandoned underground facilities discovered during excavation undermine the value of the 811 process that provides an approximation of underground facilities in the area for excavation to safely proceed. Current law has requirements on the abandonment of underground facilities, but few on communication between parties following the discovery of abandoned or possibly abandoned underground facilities. The Board held a virtual workshop on April 26 to learn more about safe excavation and communication around abandoned underground facilities such as how parties communicate with one another and how to better detect abandoned facilities during locate and mark practices. Due to the abbreviated period between the workshop and the publishing of this report, staff expects to provide its analysis in a future staff report. Staff recommends the Board continue information gathering and proceed with standards development into the topic of abandoned facilities.

STRATEGIC PLAN

2021 Strategic Plan Objective: Improve Excavation Safety and Location Practice Safety

Strategic Activity: Develop Safety Standards

BACKGROUND

Building on its earlier efforts from July 2018 and to fulfill its statutory charge to develop safety standards,¹ the Board built a general framework in July 2020² for how to approach the development of these standards for different types of excavation. That fall, the Board's Safety Standards Committee³ began information gathering through a survey and workshops

¹ [Cal. Gov. Code § 4216.18](#)

² [July 13-14, 2020, Agenda Item No. 7, Discussion on Reasonable Care Standards Development](#)

³ This committee previously went by the name Reasonable Care Committee.

exploring trenchless excavation^{4,5,6} and then in 2021 moved on to information gathering on excavation for road construction and maintenance, efforts that proceeded through the summer.⁷

The Board discussed the issue of abandoned underground facilities at its June 2020 meeting during which it determined that abandoned facilities would be best addressed through the ongoing work being conducted by ⁸ The Safety Standards Committee determined that the topic of abandoned underground facilities involved subtopics of standards development, such as mapping, facility marking, communication between parties, and determining the exact location of facilities, and brought the proposal to the Board to directly work on abandoned underground facilities at its November 2021 meeting and to which the Board agreed to proceed.⁹

The November 2021 staff report “Update on Safety Standards – Next Steps” discussed two Board investigations which involved abandoned underground facilities and ways in which abandoned underground facilities undermine the 811 process by denying the excavator the ability to apply safe techniques to avoid the facility. The November 2021 report outlined next steps to consider resource impacts to operators and excavators, communication between parties following the discovery of abandoned facilities, and research into current law around abandoned facilities.

DISCUSSION

Definition of Abandoned Underground Facilities

While California law does not currently provide a definition of abandoned underground facilities, for the purposes of this discussion and unless otherwise stated, staff considers an abandoned facility to be the same as defined by the Common Ground Alliance (CGA): a facility no longer in use.¹⁰

Abandoned Facilities Undermine the Value of the 811 Process

Abandoned underground facilities unknown to an operator can cause an operator to mark that abandoned facility instead of an active facility they are attempting to locate. This puts an excavator in danger of striking an active facility of which the operator did not respond or notify the excavator. CGA calls attention to this safety issue in the Damage and Information Reporting Tool (DIRT) Report 2020, which finds that abandoned facilities interfere with locate and mark

⁴ [August 10-11, 2020, Agenda Item No. 6, Discussion of Reasonable Care Standards Workshop](#)

⁵ [September 14, 2020, Agenda Item No. 18, Discussion on Reasonable Care Standards Development for Trenchless Excavation Techniques](#)

⁶ [November 16, 2020, Agenda Item No. 9, Update on Reasonable Care Standards Development for Trenchless Excavation Techniques](#)

⁷ [May 11, 2021, Agenda Item No. 8, Update on Safety Standards](#)

⁸ [June 8, 2020, Item No. 5, Abandoned Underground Facilities in California](#)

⁹ [November 9, 2021, Item No. 5, Update on Safety Standards – Next Steps](#)

¹⁰ [CGA Best Practices Appendix A Glossary of Terms and Definitions](#)

practices nationwide and that this was the root cause of nearly 8% of dig-in damages that year. Damages due to inaccurate markings caused by abandoned facilities was the 3rd leading root cause only behind damages without a ticket and excavation without verification of the location of a facility.¹¹

Reported Damages by Root Cause for 2020

Coded by Root Cause Group

Root Cause	Reports	2020 % of Total	2019 % of Total
No Notification made to one call center / 811	84,918	31.81%	29.10%
Excavator dug prior to verifying marks by test-hole (pothole)	41,446	15.53%	1.94%
Facility marked inaccurately due to abandoned facility	20,569	7.71%	7.29%
Facility not marked due to locator error	17,539	6.57%	3.56%
Excavator failed to maintain clearance after verifying marks	17,128	6.42%	16.70%
Facility marked inaccurately due to locator error	15,163	5.68%	10.57%

Legend

- Excavation Practices
- Invalid Use of Request by Excavator
- Locating Practices
- Miscellaneous
- No Locate Request

Figure 1: Selection from Page 19 of the CGA DIRT Annual Report for 2020 Reported Damages by Root Cause showing consistency in abandoned facilities as the root cause of damages from 2019 to 2020.

Abandoned facilities undermine the value of the 811 process that bolsters public and worker safety when excavating around underground facilities. If an operator does not maintain records on underground facilities that they abandon, the operator can't notify excavators of their underground facility. The Dig Safe Act of 2016 recognized this issue and required operators to retain records of underground facilities they have abandoned.¹²

However, because this statutory requirement began in 2017, operators may have not maintained records on decades of abandoned underground facilities. The Board finds evidence of these missing records and the extent of abandoned facilities in three ways:

- Board investigations involved abandoned facilities nearly 10% of the time, or 19 total, in 2019.¹³
- 41% of, or 15 total, respondents to the Board's Trenchless Excavation Survey in 2020 indicated that respondents encountered abandoned facilities either "Very Often" or "Often" when using trenchless excavation methods.¹⁴
- In the Board's Earthwork and Road Construction Excavation workshop, two attendees discussed the expectation that they would discover abandoned underground facilities in dense, urban areas such as Los Angeles. A few excavators also discussed the use of locating equipment to check the delineated area for abandoned facilities not indicated in the locate marks or utility maps. Other workshop discussion noted that operators may anticipate encountering abandoned facilities and require the use of ground penetrating radar (GPR) in addition to locate and mark practices.¹⁵

¹¹ [CGA DIRT Annual Report for 2020](#), Page 19

¹² [SB 661 \(Hill, 2016, Chapter 809\) Protection of subsurface installations.](#)

¹³ [November 9, 2021, Item No. 5, Update on Safety Standards – Next Steps](#)

¹⁴ [November 16, 2020, Item No. 9, Update on Reasonable Care Standards Development for Trenchless Excavation Techniques](#)

¹⁵ [June 21, 2021, Item No. 1, Workshop: Earthwork and Road Construction Excavation](#)

Excavators are not notified of abandoned facilities without records and instead excavators discover these facilities while excavating. Discovery necessitates communication between parties to determine the facility identity and status. The immediate impact is project delays for excavators.¹⁶ However, this discovery of abandoned facilities in the act of excavating can also damage the excavating equipment and lead to costly repairs.¹⁷

If a facility is judged to be inactive when the facility is in fact active, further damages may occur that place workers and the public at risk of harm. For instance, the Board discussed an investigation in which an operator directed an excavator to cut an active telecommunications line without determining the facility identity or status and led to a communication outage at a local police department.¹⁸

California statute establishes some procedures for working around abandoned underground facilities, however statute does not specify how parties should determine the identification and the status of abandoned facilities nor communicate that information to other parties.

Government Code 4216 Requirements and Communication Gaps around Abandoned Facilities

Government Code 4216 provides limited processes for working around abandoned facilities, however statute also contains ambiguities and gaps in communication for these processes:

- Operators are required to maintain records of abandoned facilities starting from January 1, 2017 and to update that information as it becomes known.¹⁹
 - This creates the obligation for operators to re-incorporate records of their underground facilities as facilities are discovered. However, an operator may not be on a ticket if they do not have the record of the abandoned underground facility to begin with or are not included in the notification area for other active facilities. In that case, communication outside the operators on a ticket would be necessary to determine ownership of the abandoned facility.
- Operators are required to mark the presence of known abandoned underground facilities in the delineated area with an “A” in a circle to notify an excavator of abandoned facilities in the delineated area.²⁰ An operator is also required to provide information on active and inactive facilities or to locate and mark their facilities.²¹
 - Without a statutory definition of what an abandoned facility is, an “A” marking can create an ambiguity in communication. With the addition of an “A” marking to the delineated area, an abandoned facility could be double counted in the locate markings, for example with a centerline marking and an additional “A” marking to

¹⁶ [June 8, 2020, Item No. 5, Abandoned Underground Facilities in California](#) Page 3, Case Example #3

¹⁷ [June 8, 2020, Item No. 5, Abandoned Underground Facilities in California](#) Page 3, Case Example #1

¹⁸ [June 8, 2020, Item No. 5, Abandoned Underground Facilities in California](#) Page 3, Case Example #2

¹⁹ [Cal. Gov. Code § 4216.3\(a\)\(4\)](#)

²⁰ [Cal. Gov. Code § 4216.3\(a\)\(1\)\(C\)](#)

²¹ [Cal. Gov. Code § 4216.3\(a\)\(1\)\(A\)](#)

indicate that the particular facility is abandoned. Marking in that way could instead indicate to an excavator that the operator knows of other abandoned facilities in the delineated area.

- If an operator knows that there is an abandoned facility in the area but the operator does not know the location of the facility, this information may still be valuable to other operators. As discussed above, CGA reports that the presence of abandoned facilities can cause inaccuracies in locate and mark practices. Knowing there may be abandoned facilities in the area could cause other operators to use alternative sources of information to verify the location and accuracy of locate and mark practices for their facilities.²² However, statute has the “A” marking as communication to excavators alone.
- Only a qualified person can perform underground facility locating, and the personnel performing locate activities on behalf of an operator are required to have access to alternative sources of verification of the location of a facility.²³
 - If an operator lacks records of abandoned facilities, the operator creates a greater burden for excavators to locate facilities prior to excavation to protect their workers and equipment. “Qualified person” is not defined in Government Code 4216, however both excavators and operators are reported to use locating equipment in addition to locate and mark practices. These practices may be used to check for abandoned facilities in the area. The Board has heard limited information on these practices to date.
 - Operators may contract third parties to complete locate and mark activities on their behalf. However, statute does not define the alternative sources of information that all qualified personnel ought to have access to. Because of that ambiguity it’s possible that an operator and a third-party contractor could have different knowledge of the presence of abandoned facilities in the delineated area.
- If an excavator discovers damage to a facility, the excavator can contact the one-call center for the operator’s contact information. If the operator of the facility is unknown and the discovery takes place outside the working hours of the one-call center, the excavator can follow the instructions of the one-call center website or recorded message.²⁴
 - Because the excavator is the party discovering damage to a facility with an unknown operator, the excavator is the only party that can begin the process to identify the facility operator. However, it may be impossible for an excavator to distinguish whether the facility with an unknown operator is an abandoned facility, a facility that was not marked or notified, or a facility requiring remarks.²⁵ A situation may fall under a combination of those cases, and in order to proceed with excavation, the

²² [Cal. Gov. Code § 4216.3\(a\)\(3\)](#)

²³ [Cal. Gov. Code § 4216.3\(a\)\(2\) and \(3\)](#)

²⁴ [Cal. Gov. Code § 4216.4\(c\)\(1\)](#)

²⁵ [Cal. Gov. Code § 4216.3\(b\) and \(e\)](#)

excavator must determine the facility operator and induce that operator to determine the facility's status as active or abandoned.

- Statute requires that an excavator must presume all subsurface installations to be active.²⁶
 - If an excavator must presume active status, only an operator can determine the status of a facility with an unknown operator. However, statute does not specify a process for communication between parties after the one-call centers provide instructions to the excavator nor the obligations of parties to determine the ownership, identity, and status of a facility.
- Statute defines active and inactive status of facilities.²⁷
 - Inactive facilities are defined as remaining connected to facilities actively carrying service in this definition. "Abandoned facilities" are undefined in statute.

The April 26 workshop on abandoned facilities covered all these topics through the discussion questions below.

California Law on Abandoned Facilities in Addition to Government Code 4216

California Department of Forestry and Fire Protection (CAL FIRE) Office of the State Fire Marshal Pipeline Safety Division

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) grants the CAL FIRE Office of the State Fire Marshal Pipeline Safety Division (OSFM PLS) sole jurisdiction over safety of intrastate hazardous liquid pipelines such as crude oil, gasoline, and propane.²⁸ OSFM PLS implemented the PHMSA-2016-0075 Advisory Bulletin recognizing only two status types for pipelines, either abandoned or active, and that abandoned pipeline means that the facility is permanently removed from service. In order to abandon a hazardous liquid pipeline with OSFM PLS, the operator must submit records showing the pipeline meets the process and abandonment requirements in accordance with PHMSA requirements. Once a pipeline is confirmed to be abandoned, it is no longer jurisdictional to OSFM PLS.²⁹

Additionally, abandoned offshore facilities and abandoned onshore facilities that cross waterways must have a report entered in the National Pipeline Mapping System (NPMS). However, the NPMS is only accurate to within 500 feet and is not intended for use in determining the exact location of abandoned facilities.³⁰

²⁶ [Cal. Gov. Code § 4216.4\(a\)\(3\)](#)

²⁷ [Cal. Gov. Code § 4216\(a\) and \(k\)](#)

²⁸ [Cal. Gov. Code § 51010](#)

²⁹ [OSFM Pipeline Safety Pipeline Status Terminology Information Bulletin: OSFM Pipeline Safety Division Pipeline Abandonment](#)

³⁰ [National Pipeline Mapping System "Learn about the Public Map Viewer"; 49 CFR Section 195.402\(c\)\(10\); 49 CFR Section 195.59;](#)

California Department of Conservation Geologic Energy Management Division

California Department of Conservation Geologic Energy Management Division (CalGEM) regulates all oil and gas facilities from the wellhead, where oil or gas is extracted from the ground in a production facility, to the sales meter of a refinery or gas utility.³¹ CalGEM inspects and requires documentation upon abandonment of wells and enforces compliance with PHMSA requirements for the abandonment of these facilities not under OSFM PLS jurisdiction.³²

California Public Utilities Commission

The CPUC regulates, inspects, and enforces the construction and operation of non-hazardous intra-state natural gas and liquid petroleum gas facilities, underground electric facilities, and communication facilities in California through regulation in General Orders 58-A, 103-A, 112-F, and 128.³³

General Order 112-F on the construction of gas facilities incorporates PHMSA requirements on the abandonment of natural gas facilities in 49 CFR § 192.³⁴

General Order 128 on electric and communication facilities requires facility operators to maintain facility location records for inspection at all times.³⁵ This order does not stipulate any requirements for the abandonment of these facilities.

General Order 103-A on water service allows for the abandonment of facilities at the end of their economic life and provides that the CPUC maintains the authority to order the abandonment or replacement of water facilities when they are inadequate to public service.³⁶ The order does not stipulate any requirements for the abandonment of these facilities.

California Department of Transportation

The California Department of Transportation (Caltrans) regulates and may permit the installation of pipelines and excavation into the state highway right-of-way through what are called encroachment permits.³⁷

The 2020 Caltrans Project Development Procedures Manual Chapter 17 on Encroachments requires removal of out of service facilities if adverse impacts to infrastructure can be avoided or otherwise the facility will be abandoned in place with records kept by operators and the Caltrans Utility Database.³⁸ These records secure knowledge of the facilities for future

³¹ CalGEM https://www.conservation.ca.gov/calgem/for_operators/Pages/Facilities.aspx; “Production Facility” defined in [Public Resources Code § 3010](#)

³² [Public Resources Code § 3208](#) and [CA Title 14 CCR 1724.1](#)

³³ CPUC [General Orders](#)

³⁴ CPUC [General Order 112-F Preamble § 101.2](#)

³⁵ CPUC [General Order 128 Rule 17.7-A “Records”](#)

³⁶ CPUC [General Order 103-A I.1.C Expiration of Economic Life](#)

³⁷ CA Streets and Highways Code § [90](#) and [670](#)

³⁸ [Caltrans Project Development Procedures Manual Chapter 17 Articles 10 and 11](#)

excavation work.

Caltrans Encroachment Permits Manual requires filling abandoned pipes with sand, two-sack slurry cement, or controlled low strength material required to protect the highway if allowed to be abandoned in place.³⁹

Local Agencies

Cities and counties have jurisdiction over encroachment in the city or county right-of-way and in municipal code can have provisions on the abandonment or removal of facilities. These requirements cover abandonment procedures and do not detail what parties ought to do in the discovery of abandoned facilities outside of the 811 process. For instance,

- Long Beach considers conditions under which facilities may be removed or whether it is in the public interest to abandon facilities in place.⁴⁰
- Sacramento allows for facility abandonment as determined by the city following the termination or dissolution of a permittee in the event that these facilities are not purchased by another company.⁴¹
- Bakersfield allows for facility abandonment and requires the operator to provide maps to the city detailing the location of the facility.⁴²

Abandoned Facilities in Other States

Current law in some other states clarifies communication around the discovery of abandoned facilities and the verification of the status of facilities.

Arizona

Arizona law requires an operator to verify the status of abandoned facilities and notify the excavator. An excavator cannot treat a facility as abandoned and disconnected from former pipelines until verification is made by an operator. If an excavator encounters an abandoned line, they contact the one-call center who dispatches an operator qualified to determine what the facility is, and then the one-call center reimburses the operator for this verification service without cost to the excavator.⁴³

This process creates a standard communication practice between parties and safeguards the excavator from interacting with possibly active facilities.

Maine

The Maine Public Utilities Commission requires that the operator must notify the excavator of known abandoned facilities. When an excavator uncovers a line they did not know about and

³⁹ [Caltrans Encroachment Permits Manual Chapter 600 Utility Permits Section 602.3](#)

⁴⁰ [Long Beach Municipal Code Section 15.14.150](#)

⁴¹ [Sacramento City Code 12.12.270 Removal following termination or dissolution of permittee](#)

⁴² [Bakersfield Municipal Code 12.16.280 Abandonment of underground facilities, reports, and maps.](#)

⁴³ [Ariz. Rev. Stat. § 40-360.22\(L\)](#)

that may be an abandoned line, the excavator contacts the operator, and the operator is required to visit the site and determine if a facility is active or inactive.⁴⁴

This provision again requires that abandoned utilities are properly identified by operators prior to further excavation, allowing the excavator to plan how to safely work around the facility.

Virginia

Virginia law requires that an operator shall attempt to keep records of abandoned facilities, excluding service lines to single-family residences, and provide that information to the excavator.⁴⁵ If an operator is notified of the discovery of an abandoned facility, the operator must respond in 27 hours not including weekends and holidays. If site conditions cause delays, the operator must notify the excavator and parties can come to a mutual agreement to defer the determination no later than 8 days. Operators are also required to record and maintain the location information of some abandoned utilities.⁴⁶

Common Ground Alliance Best Practices with Abandoned Facilities

Government Code 4216.18 directs the Board to develop safety standards relevant to excavating around subsurface facilities and that these standards are not intended to replace other standards such as the CGA Best Practices.⁴⁷ There are six CGA Best Practices that primarily relate to abandoned facilities, where CGA recommends that:

- Designers use all available information, including on abandoned facilities.⁴⁸
- Designers include information on abandoned facilities in design plans.⁴⁹
- One-call centers have a process for the identification of unknown facilities.⁵⁰ The CGA Best Practices do not define unknown facilities.
- An operator attempts to locate and mark when an abandoned facility is known in an area.⁵¹
- If an excavator discovers an unmarked facility, they stop work and notify the one-call center.⁵²
- An operator collects mapping information on abandoned facilities.⁵³

California statute in Government Code 4216 incorporates provisions about the notification of abandoned facilities when known and that an excavator contacts the one-call center when the

⁴⁴ [65 407 Me. Code R. 895 § 6\(F\)](#)

⁴⁵ [Va. Code Ann. § 56-265.19\(G\)](#)

⁴⁶ [20 Va. Admin. Code § 5-309-165](#)

⁴⁷ [Cal. Gov. Code § 4216.18](#)

⁴⁸ [CGA Best Practices 2.2 Gathering Information for Design Purposes](#)

⁴⁹ [CGA Best Practices 2.3 Identifying Existing Facilities in Planning and Design](#)

⁵⁰ [CGA Best Practices 3.25 Identification of Unknown Lines](#)

⁵¹ [CGA Best Practices 4.11 Abandoned Facilities](#)

⁵² [CGA Best Practices 5.21 Mismarked Facilities](#)

⁵³ [CGA Best Practices 6.16 Information Capture](#)

operator of a utility is unknown.⁵⁴ The CGA Best Practices do not prescribe obligations between excavators and operators during the identification of an abandoned facility.

Abandoned Underground Facilities Workshop

The Board held a virtual workshop on April 26 from 9 to 11 a.m. to better understand safe excavation and communication practices around abandoned facilities. Comments provided in the workshop will be used to improve public and worker safety through the Board's standards development.

Due to the abbreviated period between the workshop and posting timeframe for this report, staff plans to provide its analysis of the workshop in a future staff report.

Workshop Discussion Questions

Attendees discussed the following questions at the April 26 workshop:

Questions to excavators:

- Have you experienced a project delay due to abandoned facilities? If so, what impacts did the delay have?
- What is your process to determine that an unknown utility was not marked or that it is an abandoned line?
 - How do you narrow down who could be the potential owner of an unmarked utility?
 - Have you ever had to request that every operator on a ticket return to the site to verify the ownership of the facility? What happened?
- Have you ever discovered a facility that is not claimed by any operator?
 - What process did you follow to come to that conclusion?
 - If conflicting with your work, how was the conflict resolved?
- Have you been notified of an abandoned facility by an "A" inside a circle in the delineated area and then had difficulty finding the exact location of that facility?
 - Did you need additional information from the operator to locate the facility?

Questions to facility locators

- How does a locator know or determine that a line is abandoned in the delineated area?
 - Have you ever detected more facilities in an area than you were expecting?
 - Is that information shared with other parties?

⁵⁴ [Cal. Gov. Code § 4216.4\(c\)\(1\)](#)

- According to the Common Ground Alliance Damage and Information Reporting Tool (DIRT) Report from 2020, the 3rd highest cause of dig-in damages nationwide was inaccurate facility markings due to interference from abandoned facilities.
 - Do you have any recommendations to detect abandoned facilities while performing locate and mark activities?
 - Do your locating practices change when locating in the vicinity of abandoned facilities? In what ways?

Questions to facility operators

- What steps do you take to verify the ownership of a facility after being notified that an abandoned facility may be yours?
- What information about abandoned facilities do you provide to locators contracted on behalf of your company?
 - Do you use a consistent format for providing that information?
- How do you communicate to other parties that you have determined an abandoned facility is or is not yours?
 - How do you communicate this determination to other operators?
 - How do you communicate this determination to an excavator?
- If you determine that an abandoned facility is yours, what steps do you take to incorporate the facility into your records?

RECOMMENDATION

Staff recommends the Board continue information gathering and proceed with standard development.