Communication from Public

Name:	Pico Robertson Health and Safety Coalition
Date Submitted:	03/12/2023 10:26 AM
Council File No:	21-1025
Comments for Public Posting:	Please see the appended email sent to CD5 on February 26, 2023. It is the 4th of a set of 4 emails submitting detailed information and documents about eight (8) new unapproved (and hence prohibited) projects on oil wells at the West Pico, Hillcrest, and Rancho Park Drill Sites in CD5. THIS EMAIL PROVIDES DETAILS AND EXTENSIVE DOCUMENTATION ON AN UNAPPROVED WELL CASING REWORK PROJECT INITIATED AT WEST PICO IN NOVEMBER 2022, WHILE NASE'S APPEAL (cf 21-1025) HAS BEEN OPEN ON CITY COUNCIL'S DESK. There is a shockingly contemptuous pattern and practice of executing prohibited projects at Drill Sites in LA City in general, maybe nowhere more so than in CD5 and at at West Pico in particular. CEQA violations are ongoing and growing at West Pico, and along with so many nearby unapproved projects constitute an extraordinary kind of Cumulative Impact. For those reasons and many more, the Categorical Exemption in the West Pico case is entirely inappropriate.

Subject: email 4 of 4: Documents and information on the new casing rework project at West Pico
From:
Date: 2/26/2023, 12:06 PM
To: Katy Yaroslavsky <katy.yaroslavsky@lacity.org>, Gary Gero <gary.gero@lacity.org>, Kristen Pawling <kristen.pawling@lacity.org>
CC:

Dear Gary, Kristen, and Katy

This fourth email (4th of 4) transmits documentation and information on the new well casing rework project at the West Pico Drill Site operated by Pacific Coast Energy Company (PCEC), as well as indications of additional serious safety and regulatory problems coming to light at this Drill Site.

Basic points to follow in the documents and accompanying explanation:

- The new well casing rework project was initiated with an NOI application submitted to CalGEM in November 2022. It is awaiting permit approval from CalGEM.
- Because there was no ZA case, there was no City approval and no CEQA clearance of any kind, in violation of City law, State CEQA law, and the City's duty to implement CEQA.
    - LAMC 13.01.I prohibited unapproved well projects, including "maintenance," until it was deleted from City code on 1/18/23. An unapproved oil well project is a prohibited project.
    - The new oil ordinance expressly prohibits "maintenance" projects and the ZA interpretation issued on January 17, 2023 (ZA-2022-8997-ZAI) includes as prohibited any "scope of work that requires a Notice of Intention 'Rework Permit' to carry out a rework project on a well from the California Geological Energy Management Division (CalGEM)." A health, safety, or environmental protection exception would require an application to the ZA, but none has been submitted.
- I do not yet have copies of the NOI permit application to CalGEM for this well casing rework project.
    - CalGEM makes them publicly accessible online after it approves permits.
    - I sent a CPRA request for the NOI application. CalGEM is proposing release of records in May.
    - Both Senator Stern's office and Assembly Member Bryan's office are trying to expedite release of the records.
- Despite not having the NOI application, I have already shown you in email #3 (incorporated herein by reference) that:
    - 1) An oil company cannot submit a NOI permit application to CalGEM without filling out the required CEQA section of the online forms.
    - 2) The only options on the form are to assert A) that no local approval and local lead agency CEQA clearance are required OR to assert B) that local approval and local lead agency CEQA clearance have been granted. Either option would be a false statement for this NOI application because local approval and CEQA clearance are required but have not been granted.
- I checked with the ZA's office and confirmed that PCEC has not notified the ZA about the new project initiated in fall 2022 and has not submitted any application for it. The ZA's office was

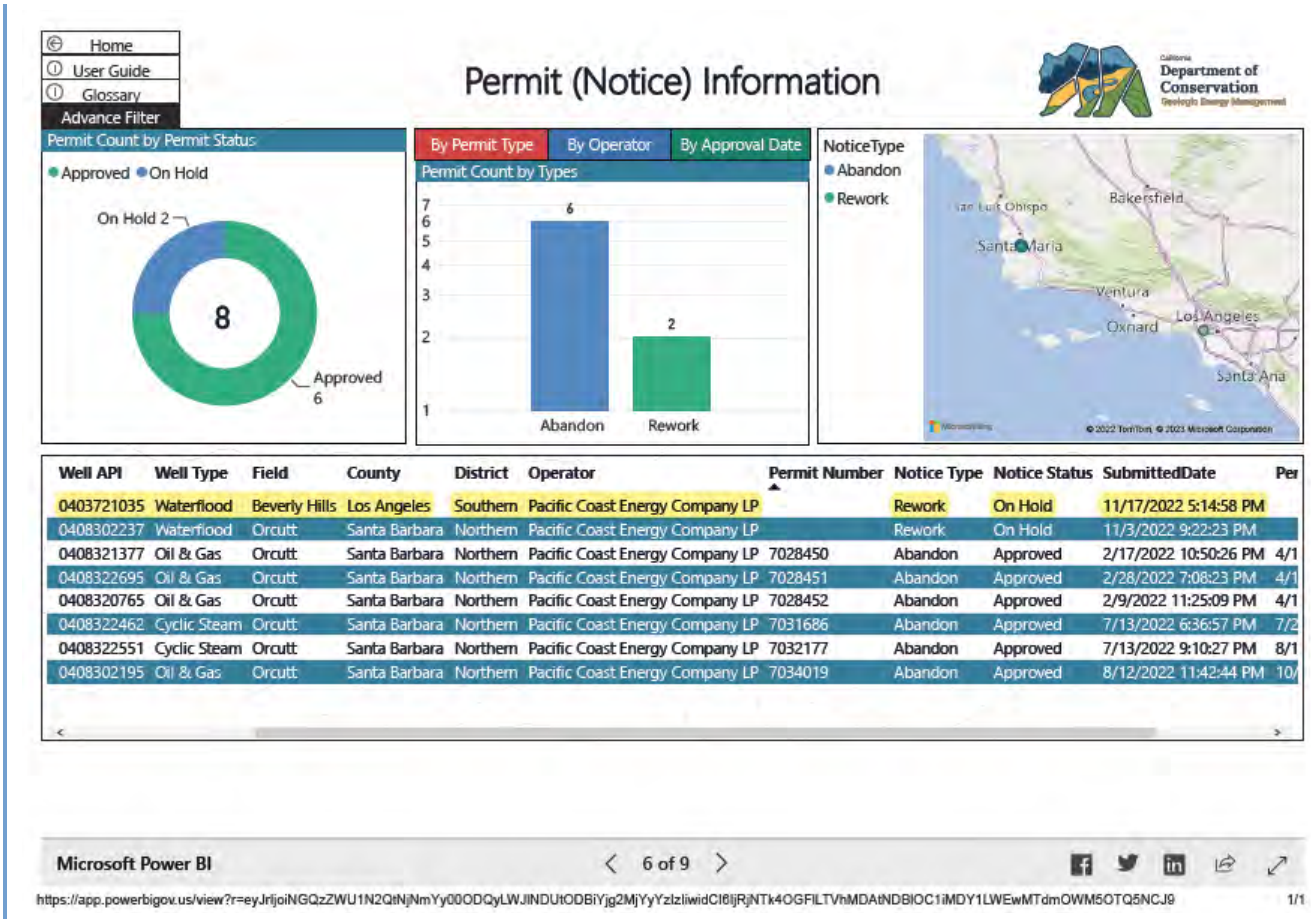
unaware of any of the new projects at Drill Sites in CD5 until they saw copies of my emails to you.

- There is a shockingly contemptuous pattern and practice of executing prohibited projects at Drill Sites in LA City in general, maybe nowhere more so than at West Pico:
  - The West Pico Drill Site is the subject of a ZA review that is still open, not just on the ZA's desk, but on City Council's desk, too.
  - While the case has been open, new episodes of noncompliance with City law, noncompliance with City approvals and agreements, and environmental impact keep piling up.
    - In December 2021 there was a surface spill stemming from 20 years of pipeline violations, prompting Notices of Violation from CalGEM, LAFD CUPA, and LACFD, and also prompting a Water Board clean up case that is likley to continue for years.
    - And now another new project on an oil well has been set in motion, once again without even applying to the ZA for review, CEQA clearance, and approval as required by City and State laws.
  - PCEC seems to have learned the lesson that City laws and CEQA are there to be ignored and evaded.
- The unapproved (and hence prohibited) well casing rework project at West Pico seems very likely to be linked to a CalGEM/Water Board Underground Injection Control (UIC) review that appears to be identifying additional safety and compliance problems. The UIC review is revealing yet more ongoing patterns of noncompliance that violate ZA conditions, too.
- This is a seriously troubled and mismanaged Drill Site.

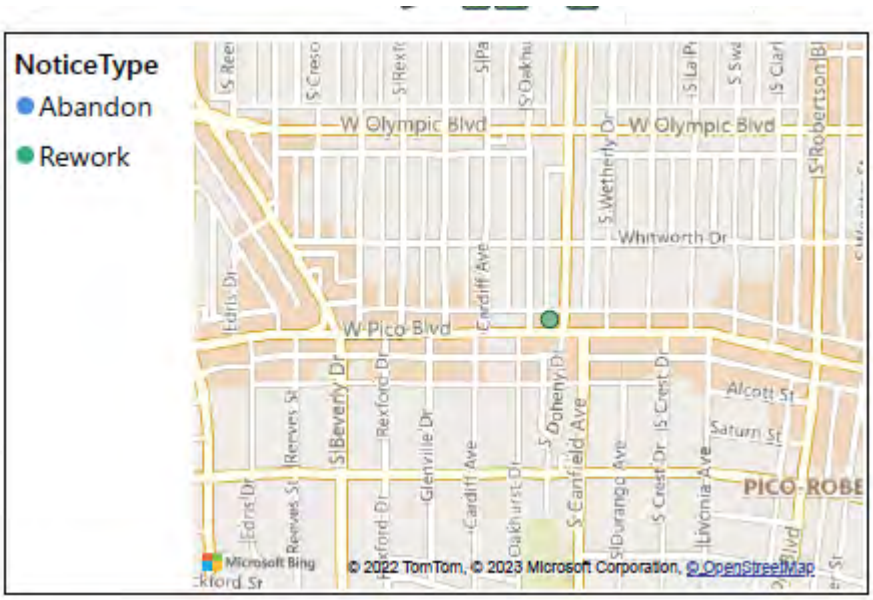
The key permitting documents from CalGEM are not yet publicly available. But there are records proving that these projects have been initiated. Those records are itemized here and copies are attached to this email as pdf files.

CalGEM's WellSTAR Dashboard has a Permits tab that lists NOI applications submitted and status of the applications, searchable by company, county, oil field, lease, year submitted, year permit approved, and other criteria. Data is updated every work day. A search for new NOI applications for well projects in LA City takes about 2 minutes to perform.

- A copy of a screen capture of search results for all NOI applications submitted by PCEC in 2022 is attached, with the NOI application to Rework API 0403721035 (WP30) highlighted. The wells at the West Pico Drill Site tap the "Beverly Hills Oil Field," which is underground and spreads on both sides of the Beverly Hills and LA City border.
- Here is a snapshot of the CalGEM WellSTAR Dashboard Permits page for NOI applications submitted by PCEC in 2022:



- Here is a snapshot of a zoomed-in view of the map showing that the NOI application to Rework API 0403721035 (WP30) is for the West Pico Drill Site:



The WellSTAR page for well API # 0403721035 that is the subject of the NOI application has a viewable copy of the Notice of Abeyance that was issued on December 5, 2022. The Notice of Abeyance provides additional detail about the project.

- A copy of the Notice of Abeyance issued by CalGEM is attached. The Notice states that the "Division has received your Notice of Intention to Rework" the well identified as API 0403721035, also identified colloquially as well "West Pico 30" (WP30), and is holding the application in abeyance, to be decided "at a later time."
- Please also note that the subject line of the Notice of Abeyance provides more information about the project, namely that the project is to "Squeeze the perforated DM sands with cement to plug them off and return the well to injection."

CalGEM puts applications "on hold" and issues Notices of Abeyance when an application is missing data.

- Explanation and documentation from prior emails incorporated herein by reference.

SB 1137 has been suspended. When CalGEM deems this NOI application to rework the well casing complete it will almost certainly approve the permit (unless the City tells CalGEM there is no local approval and no local lead agency CEQA clearance, both of which are required; City law prohibits the project without ZA review and approval, and the City Code requirement of discretionary review triggers the City's duty to implement CEQA as the local lead agency).

- Explanation and documentation from prior emails incorporated herein by reference.

Explanation of the project.

- The description of the project in the subject line of the Notice of Abeyance ("Squeeze the perforated DM sands with cement to plug them off and return the well to injection") has a mixture of jumbled syntax and technical terms that I can straighten out and explain.
- The well in question, API 0403721035 (WP30) is an injection well that is in active use. The project is to squeeze cement into and through perforations in the well casing that are located in a geological zone called the "DM sands" in order to close and seal those perforations, and then to return the well to active use as an injection well.
- No new perforations will be made in the casing because there already are perforations in another deeper geological zone called the "Hauser" zone. Older CalGEM records for the well show that there are perforations in the casing from 6,308 feet deep to 7,550 feet deep, and also holes in the casing at 6,280 feet.
- See the attached records for the 2016 Rework of well API 0403721035 that added new perforations.
    - *First, parenthetically, I want to note that the 24 major unapproved well projects executed from 2000 to 2016 included only the drilling of 2 new wells, the redrilling of 12 wells, and the conversion of 10 wells between injector and producer. NASE and I focused on the biggest major projects that needed the least explanation of their obvious violation of City Code and CEQA. There were also multiple casing rework projects like this one, which were also executed without application to or notification of the ZA.*
    - The NOI application, permit and well history documenting the 2016 project are included. The well history lists the perforations that existed in the "Pre-Work Condition" of the well and in its"Post-Work Condition" with the depths of the new perforations entered in bold. The notation "4, 1/2 JHPF" next to depth ranges means there are 4 1/2 jet perforated holes per foot within those ranges, and "1 1/2 JHPH" means one jet perforated hole per foot.

Here is a screen shot:

> NATURAL RESOURCES AGENCY OF CALIFORNIA
> DEPARTMENT OF CONSERVATION
> DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES
>
> **HISTORY OF OIL OR GAS WELL**
>
> Operator Pacific Coast Energy Company LP Field Beverly Hills County Los Angeles
> Well West Pico 30 Sec. 30 T. 01S R. 14W S.B. B.&M
> A.P.I. No. 037-21035 Name Tom McCollum (Person submitting report) Title Agent (President, Secretary, or Agent)
> Date 09/21/2016 (Month, day, year)
> Signature for T. McCollum
> Address 1555 Orcutt Hill Rd., Orcutt Ca., 93455 Telephone Number (805) 937-2576
>
> History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.
>
> **Pre-Work Condition:**
>
> | | | | |
> |---|---|---|---|
> | 20" | | Conductor | C. 52.5' MD |
> | 10-3/4" | 40.5# | K-55 | C. 1,200' MD |
> | 7" | 26# | N-80 & K-55 | C. 7,890' |
> | | Effective Perforations: | | 6,308' – 6,318', 6,356' – 6,374', |
> | | | 4, 1/2 JHPF | 6,390' – 6,448', 6,460' – 6,497', |
> | | | | 6,750' – 6,802', 6,817' – 6,856', & |
> | | | | 6,870' – 7,060' |
> | | | 1, 1/2 JHPF | 7,235' – 7,370', 7,400' – 7,550' |
>
> **Post-Work Condition:**
>
> | | | | |
> |---|---|---|---|
> | 20" | | Conductor | C. 52.5' MD |
> | 10-3/4" | 40.5# | K-55 | C. 1,200' MD |
> | 7" | 26# | N-80 & K-55 | C. 7,890' |
> | | Effective Perforations: | | 6,308' – 6,318', 6,356' – 6,374', |
> | | | 4, 1/2 JHPF | 6,390' – 6,448', 6,460' – 6,497', |
> | | | | 6,750' – 6,802', 6,817' – 6,856', & |
> | | | | 6,870' – 7,060' |
> | | | | **6,770' – 6,790', 6,820' – 6,840',** |
> | | | | **7,060' – 7,130', 7,240' – 7,410', &** |
> | | | | **7,430' – 7,500'** |
> | | | 1, 1/2 JHPF | 7,235' – 7,370', 7,400' – 7,550' |

- The attached wellbore diagram from 2014 indicates there is an "injection packer" at 6,256 feet deep to seal the inside of the casing at the top of the injection zones and also 4 holes in the casing at 6,280. The diagram shows the Hauser zone starting at 6,300 feet deep and it shows the Dunsmuir (DM) Sands above 6,300.

Why has PCEC initiated the project? It might be because of an in depth review of the Underground Injection Control (UIC) project that appears to be identifying a possibly wide range of problems at the troubled and poorly managed West Pico Drill Site.

- The answer to this question is not yet fully clear, but there are strong indications in the available documents.
- CalGEM initiated an in depth Project by Project review of the West Pico Drill Site's Underground Injection Control (UIC) project in February 2021.
    - Almost all of 2021 and 2022 were devoted to trying to gather documentation from PCEC, which required a long series of follow-up requests from CalGEM to PCEC. It does not appear that PCEC has been diligent in providing information nor careful in providing quality data.
    - The requests from CalGEM to PCEC are publicly viewable on the "Documents" tab of the WellSTAR page for PCEC's West Pico UIC project. Copies of CalGEM's correspondence are attached.
        - PCEC's responses and the documentation they submitted are not publicly viewable on WellSTAR. I have submitted a CPRA request for the records, and Senator Stern's office and Assembly Member Bryan's office are seeking expedited release of the records.
        - But the specifics of CalGEM's repeated requests for data and documents indicates that PCEC repeatedly failed to comply with requirements and frequently provided

data that appears to be strikingly unprofessional in quality. See, CalGEM's comments the checklists that CalGEM returned to PCEC with CalGEM's letters requesting more data and documentation, especially the communications dated September 9, 2021; February 25, 2022; June 23, 2022; and September 28, 2022.

- *It should be noted that PCEC's 2 years of foot-dragging and apparent sloppiness in complying with a review required by the Federal Safe Drinking Water Act has transpired during the time the West Pico ZA case has been open. CalGEM's repeated requests for a basic level of professional quality information about wells, geology, and injection well data seem to reflect poorly on PCEC's management of critical drill site operations related to protecting the environment and, in particular, fresh groundwater.*
- *On March 24, 2022, the ZA wrote to PCEC and informed them that the pipeline leak, the spill that surfaced on December 11, 2021, and their causes (which stretch back to 2001) all violated Condition 48 of the ZA's 2000 approval for the site:*

> 48. Conformance With Regulatory Oversight. All operations at the site relating to drilling and production activities shall be carried out in accordance with the applicable rules of the California Division of Oil, Gas and Geothermal Resources, including all rules and regulations related to the full protection of the public water supply.

- *PCEC has demonstrated a clear and ongoing contemptuous failure to conform to regulatory oversight, from unapproved projects in violation of City Code and CEQA to non-conformance with the requirements of the UIC review. This puts the community and the environment at unnecessarily increased risk. The ZA and the City is not supposed to allow this.*

- CalGEM's September 28, 2022 follow-up request to PCEC for documentation (copy attached) has an item relating to the well in question here, WP 30 (API 0403721035). Here is a snaphot of CalGEM's request for data concerning the well from page 3 of the pdf (SRT is a Step Rate Test to determine the maximum injection pressure allowable; too high pressure would fracture the geological formation, potentially damage the well and the oil reservoir, and could send injected fluid into unapproved zones):

> AOR map.
>
> 4. WP30 is open to both DM sands and Hauser. Please clarify and confirm if 0.64 psi/ft frac gradient established by the SRT is for Hauser only or for combined Hauser and DM sands (note that CalGEM Datasheets indicate that DM sands have higher permeability of 107 md compared to 77 md for Hauser). It is highly recommended to compare injection rates during SRT with those of injection surveys to check on possible opening of DM sands at relatively higher rates during testing. Explain and support your conclusions.

- The release of documents that PCEC has submitted to CalGEM for the UIC review and for the NOI application might confirm that the data request from CalGEM flagged an operational problem in Well WP30 (API 0403721035) that PCEC wants to solve by cementing closed the perforations in the DM (Dunsmuir) sands so that the well injects only into the Hauser zone. CalGEM's follow up request for data about the maximum safe pressure for injection into the DM zone was sent September 28, 2022, and the NOI application from PCEC to seal the perforations in the DM zone was submitted November 17, 2022. That suggests there is a connection.

The UIC review, which is jointly conducted by CalGEM and the Water Board, has greater ramifications

- As explained in email 2 about the well casing rework projects at Hillcrest, the Water Board partners with CalGEM to perform UIC reviews in order to fulfill the State's obligations under the Federal Safe Drinking Water Act.
- CalGEM first notified the Water Board that it had initiated the in depth Project by Project review of the West Pico UIC project on December 14, 2022 (see attached communication from CalGEM to the Water Board). The letter from CalGEM is viewable online at the Water Board's Geotracker page for the UIC review case, under the "Documents" tab, at this link (https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000009151)
- I have communicated with one of the Water Board engineers assigned to the case. The engineer expects that the review will take around two years to complete - i.e., estimated completion in 2024.

The limited UIC review documentation that is currently available for public viewing (all from CalGEM) indicates that CalGEM has already spotted possible structural and/or environmental hazards that might need remediation.

- For example, see the February 25, 2022 CalGEM follow up request for documentation (attached), especially this passage from CalGEM's comments on page 4 of the pdf:

	Well compendium not provided. Provide compendium of wells including items listed in ES (3) as well as depth of zones, USDW, BFW, top of annular cement in production casing, and tops of injection zones. 37 WBDs are provided (34 from operator and 3 from offset operators). Some diagrams do not include required elements. Provide diagrams with all required elements. No wellbore identified as potential conduit by operator. CalGEM review identified 7 potential conduits for fluid to move outside the approved zone of injection: •WP-26 (037-20926) Open annulus from THZ/TIZ (4274'-1178') •WP-01 (037-00995) Open hole above TIZ •WP 18 RD2 (037-20434) Open hole above TIZ •HW10 RD1 (037-21994) Annular TOC below TIZ •EBH 1 (037-00994) Repetto marker not included on WBD. OH abandonment above Hauser marker. Operator needs to identify whether Repetto penetrated and depth based on logs. If not penetrating provide log data that validates conclusion. •U50-5 (037-00113) Open hole filled with mud below 1204'. No markers on diagram. •S-2A (037-20666) Repetto marker not included on WBD. No annular cement above 5390'. Operator needs to identify whether Repetto penetrated and depth based on logs. If not penetrating provide log data that validates conclusion. Identify all sand markers and impermeable strata above the zone of injection that would allow/prevent migration of injection fluids. Explain why the identified wells were not identified as conduits for fluid outside the approved zone of injection.

<u>Unlike fossil fuels, the compliance problems at the West Pico Drill Site are like a renewable resource. They multiply and grow over time, and do not stop proliferating.</u>

The West Pico Drill Site is in a Water Board clean up case from the pipeline leak and spill that will go on for at least a couple more years.

CalGEM and the Water Board are performing a UIC review of West Pico that is likely to continue for two more years, on top of the two years that CalGEM has already spent trying to pry data and documentation out of PCEC. CalGEM appears to have already identified problems requiring remediation. The Water Board has not yet started their

typically thorough review of the case.

Meanwhile, the City's ZA/CEQA case remains open and on the desk of City Council. Dozens of gross violations have been documented and more keep happening while the case is open in front of City Council.

And now there is also a new project initiated do a well casing rework job without application to the ZA, without ZA approval, and without any CEQA clearance at all. This is a new prohibited project, just like dozens of others that the City has so far not taken corrective action to remedy.

Violations of City Code and CEQA will continue to multiply until the City performs a proper enforcement action to require compliance, instead of green-lighting noncompliance with City Code and CEQA.

Dangers and hazards to the community and the environment will similarly continue to multiply at the West Pico Drill Site and at other Drill Sites in CD5 and elsewhere in the City, as long as Drill Site operators see that they can get away with it. That is the unfortunate lesson that the City has been teaching in the West Pico Drill Site case so far.

The West Pico Drill Site case is in the hands of City Council where, fortunately, Council Members "have the opportunity *right now* to take a stand against ongoing violations."

Yours

Prof. Michael Salman

Attachments:

WellSTAR Dashboard Permit page for ALL PCEC 2022 submissions highlighted.pdf	1.7 MB
WellSTAR Dashboard Permit page Map Zoomed In for ALL PCEC 2022 submissions.pdf	1.7 MB
0403721035 WP30 Notice of Abeyance 12-5-22.pdf	157 KB
0403721035 NOI Permit History 2016 rework perforate wp30 from DOGGR DATA file.pdf	2.0 MB
0403721035 wp30 wellbore diagram 2014 from DOGGR DATA file.pdf	292 KB
CalGEM UIC review initial request 2-2-21.pdf	654 KB
CalGEM UIC Review extnsion 3-18-21.pdf	287 KB
CalGEM UIC review extenions 5-12-21.pdf	368 KB
CalGEM UIC review follow up request 9-9-21.pdf	854 KB

CalGEM UIC Review extension 10-7-21.pdf	321 KB
CalGEM UIC review follow up request docs 2-25-22 highlighted.pdf	572 KB
CalGEM UIC to PCEC extension 3-10-22.pdf	345 KB
CalGEM UIC to PCEC extension 5-26-22.pdf	348 KB
CalGEM UIC to PCEC req more data 6-23-22.pdf	545 KB
CalGEM UIC review follow up req docs 9-28-22 incl WP30.pdf	378 KB
CalGEM UIC review follow up request docs 11-18-22.pdf	379 KB
CalGEM to Water Board on West Pico UIC review 2022_12_14_project received - from geotracker.pdf	105 KB

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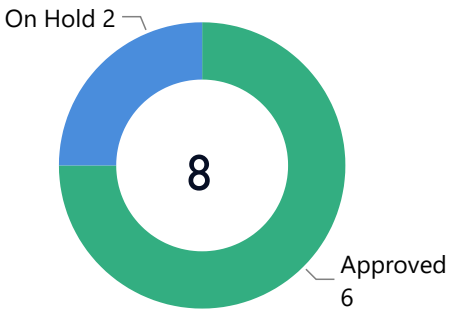
Permit (Notice) Information

California Department of Conservation
Geologic Energy Management

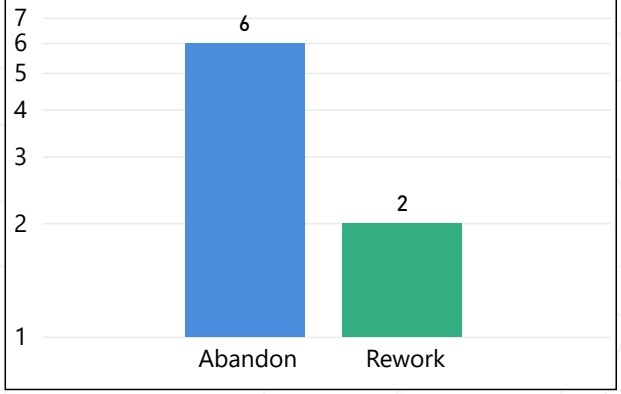
Permit Count by Permit Status

Approved On Hold



By Permit Type | By Operator | By Approval Date

Permit Count by Types



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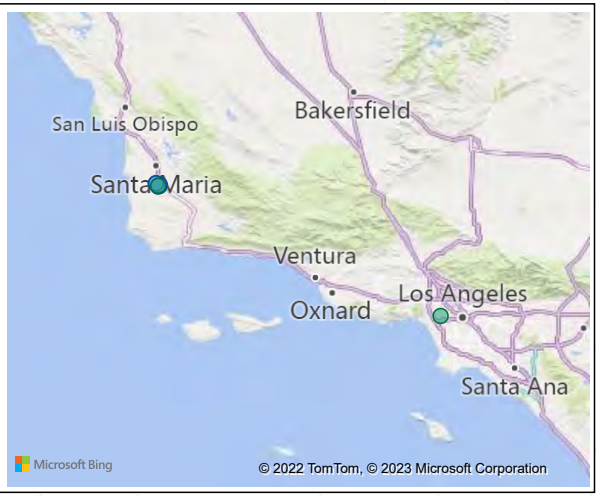
Rework



Well API	Well Type	Field	County	District	Operator	Permit Number	Notice Type	Notice Status	SubmittedDate	Per
0403721035	Waterflood	Beverly Hills	Los Angeles	Southern	Pacific Coast Energy Company LP		Rework	On Hold	11/17/2022 5:14:58 PM	
0408302237	Waterflood	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP		Rework	On Hold	11/3/2022 9:22:23 PM	
0408321377	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7028450	Abandon	Approved	2/17/2022 10:50:26 PM	4/1
0408322695	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7028451	Abandon	Approved	2/28/2022 7:08:23 PM	4/1
0408320765	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7028452	Abandon	Approved	2/9/2022 11:25:09 PM	4/1
0408322462	Cyclic Steam	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7031686	Abandon	Approved	7/13/2022 6:36:57 PM	7/2
0408322551	Cyclic Steam	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7032177	Abandon	Approved	7/13/2022 9:10:27 PM	8/1
0408302195	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7034019	Abandon	Approved	8/12/2022 11:42:44 PM	10/

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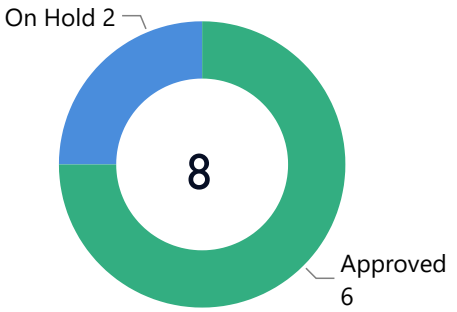
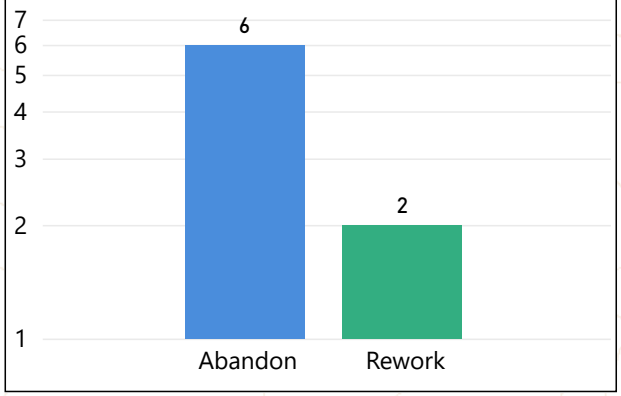
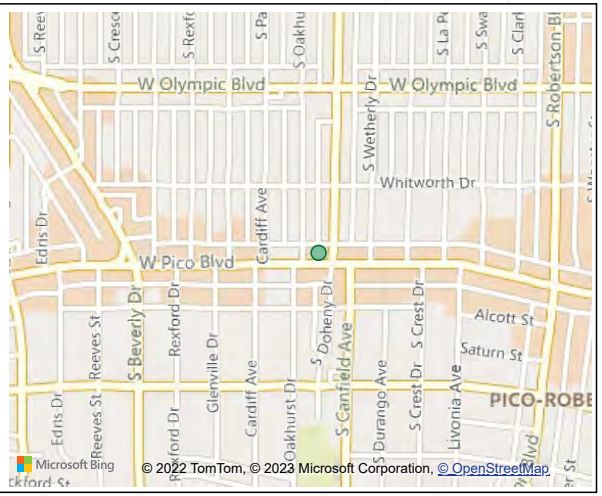


By Permit Type | By Operator | By Approval Date

Permit Count by Types



NoticeType
Abandon
Rework



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0408322695	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7028451	Abandon			Approv
0408320765	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7028452	Abandon			Approv
0408322462	Cyclic Steam	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7031686	Abandon			Approv
0408322551	Cyclic Steam	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7032177	Abandon			Approv
0408302195	Oil & Gas	Orcutt	Santa Barbara	Northern	Pacific Coast Energy Company LP	7034019	Abandon			Approv

California
Department of Conservation
Geologic Energy Management Division

Gavin Newsom, Governor
David Shabazian, Director
715 P Street, MS 1803
Sacramento, CA. 95814
T: (916) 445-5986

12/5/2022

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road
Orcutt, CA 93455

Subject: Squeeze the perforated DM sands with cement to plug them off and return the well to injection.

Dear Philip Brown,

The Division has received your Notice of Intention to Rework dated 11/15/2022 for "West Pico" 30, API. 0403721035-00, Beverly Hills field, Sec. 30, T. 01S, R. 14W, SB B&M, Los Angeles County. Please note, the Division is holding your Notice of Intention in Abeyance and will make a final determination at a later time.

If you have any supplemental questions, please contact a CalGEM office or visit us at www.conservation.ca.gov/calgem

Sincerely,

Baldev Gill
Southern District Deputy

CC People:

CC Organizations:

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

FOR DIVISION USE ONLY			
	Forms		
Bond	OGD114	OGD121	

NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog/

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework ☒ / redrill ☐ (Check one) well WP30, API No. 040372103500,

Sec. 30, T. 1S, R. 14W, SB B.&M., Beverly Hills Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)

20" Conductor cemented @52.5'
10.75" 40.5# K-55 casing Surface to 1200' cemented w/760 sacks, 15" hole
7" 26# N-80 & K-55 casing Surface to 7890', 9 7/8" hole cemented w/1386 cu.ft. class'G' + 450 Cu.ft. pozzolan 'D'

Wellbore diagram attached

The total depth is: 7890 feet. The effective depth is: 7635 feet.

Present completion zone(s): Hauser (Name). Anticipated completion zone(s): Hauser (Name).

Present zone pressure: 2200 psi. Anticipated/existing new zone pressure: 2200 psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes☒ No☐

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes☐ No☒ If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

Skid rig over WP30, function test BOPE to 3,000#s, Notify DOGGR, hold safety meeting
Unset two packers in well (Halliburton G-77 & G-6), POOH & lay down packers.
Run 7" scraper to +/-7635' (plug depth)
RIH w/test packer to pressure test casing to 2,000 psi, record test w/chart
Wireline to perforate 4 spf from 6350' to 7520' selected intervals
Stimulate 20 gals/ft with cup wash tool, displace w/lease water. RIH with new injection packer to +/- 6250' on 2 7/8" tubing
Conduct new step rate test after well has sat idle for 48 hours - notify DOGGR to witness

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: feet (Direction) and feet (Direction) Estimated true vertical depth:

Will the Field and/or Area change? Yes☐ No☒ If yes, specify New Field: New Area:

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator			
Pacific Coast Energy Company (PCEC)			
Address 1555 Orcutt Hill Rd		City/State Orcutt/CA	Zip Code 93455
Name of Person Filing Notice Tom McCollum	Telephone Number: 805-937-2576	Signature Frank Smith for Tom McCollum	Date 8/26/2016
Individual to contact for technical questions: Frank Smith or Tom McCollum	Telephone Number: 805-234-6694	E-Mail Address: frank.smith@pceclp.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

INFORMATION FOR COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA)

If an environmental document has been prepared by the lead agency, submit a copy of the ***Notice of Determination*** or ***Notice of Exemption*** with this notice. Please note that a CEQA determination by a local jurisdiction, if required, must be complete, or the Division may not issue a permit.

CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), “Critical well” means a well within:

(1) 300 feet of the following:
  (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
  (B) Any airport runway.
(2) 100 feet of the following:
  (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
  (B) Any navigable body of water or watercourse perennially covered by water;
  (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
  (D) Any officially recognized wildlife preserve.

WELL OPERATIONS REQUIRING BONDING

1. Drilling, redrilling, or deepening any well.
2. Milling out or removing a casing or liner.
3. Running and cementing casing or tubing.
4. Running and cementing liners and inner liners.
5. Perforating casing in a previously unperforated interval for production, injection, testing, observation, or cementing purposes.
6. Drilling out any type of permanent plug.
7. Reentering an abandoned well having no bond.

This form may be printed from the DOGGR website at www.conservation.ca.gov/dog/

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
5816 Corporate Ave., Suite 100 Cypress, CA 90630 - 4731

No. P 116-0230

Old	New
054	054
FIELD CODE	
03	03
AREA CODE	
10	10
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

Waterflood
PLIOCENE (Dunsmuir), MIOCENE (Hauser)
CRITICAL WELL

Cypress, California
September 6, 2016

Mr. Thomas McCollum, Agent
Pacific Coast Energy Company LP (B6127)
1555 Orcutt Hill Road
Orcutt, CA 93455

Your proposal to **rework (reperforate zone)** well **"West Pico" 30**, A.P.I. No. **037-21035**, Section **30**, T. **01S**, R. **14W**, **SB** B. & M., (Lat: **34.055538** Long: **-118.390298** Datum: **NAD83**), **Beverly Hills** field, **East** area, **Miocene** pool, **Los Angeles** County, dated **8/26/2016**, received **8/26/2016** has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout Prevention Equipment (BOPE), as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
   a. Class **II3M,** with hydraulic controls, on the **10 3/4"** casing. All casing annuli control valves must meet, or exceed, the same minimum pressure rating as the blowout prevention equipment. The pipe safety valve must be suitable for all pipe in use, including casing.
   b. A **3M lubricator** for **wireline** operations.
2. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
3. The well is designated a **CRITICAL WELL** and as such, the Notice to Operators, dated May 21, 2001, specifying additional BOPE requirements for critical wells, shall be in effect (attached).
4. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
5. This well shall conform to the provisions set forth in our letter dated **March 17, 2015**, approving the project.
6. Injection is through tubing with packer set in cemented casing immediately above the approved zone of injection.
7. Prior to commencing injection, and every **5** years thereafter, a pressure test is conducted to demonstrate the mechanical integrity of the **7"** casing. The minimum test pressure shall be **the Maximum Allowable Surface Pressure (MASP) plus any Division approved tubing friction loss.**

Continued on Page 2

Blanket Bond
UIC Project No. 05403002
cc: EDP
Los Angeles City Fire Department

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

Engineer Barry Irick
Office (714) 816-6847

By ~~For~~ Daniel J. Dudak, *District Deputy*

BI/bi

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

8. Within **90** days of commencing injection, and every **2** years thereafter, this Division shall be furnished with an injection survey that demonstrates the confinement of the injected fluid to the approved zone of injection, and the mechanical integrity of the injection tubing and packer.
9. The maximum allowable surface injection pressure for this well shall not exceed **MASP** psi. Under no circumstances shall the injection gradient exceed **0.55** psi/ft.
10. A pressure test is conducted to demonstrate the mechanical integrity of the **7"** casing.
11. No program changes are made without prior Division approval.
12. **THIS DIVISION SHALL BE NOTIFIED TO:**
    a. Inspect the installed blowout prevention equipment prior to commencing **downhole** operations.
    b. Witness a pressure test of the **7"** casing prior to commencing injection, and every **5** years thereafter.
    c. Witness the running of an injection survey within **90** days of commencing injection, and every **2** years thereafter.

NOTE:

1. All depths are based on well KB, which is 12' above ground surface.
2. The base of the freshwater zone is at **550'±**.
3. The base of the USDW zone is at **845'±**.
4. The top of the injection zone is at **5775'±**.
5. Hydrogen sulfide gas (H_2S) is known to be present in this area, adequate safety precautions shall be taken prior to and during well operations.
6. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
7. Upon completion of the proposed work, a Well Summary Report (form OG100), a History of Oil or Gas Well (form OG103), and copies of all logs, tests, and surveys shall be submitted to this office.

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Pacific Coast Energy Company LP Field Beverly Hills County Los Angeles
Well West Pico 30 Sec. 30 T. 01S R. 14W S.B. B.&M.
A.P.I. No. 037-21035 Name Tom McCollum Title Agent
(Person submitting report) (President, Secretary, or Agent)
Date 09/21/2016
(Month, day, year)
Signature for T. McCollum
Address 1555 Orcutt Hill Rd., Orcutt Ca., 93455 Telephone Number (805) 937-2576

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Pre-Work Condition:

20"		Conductor	C. 52.5' MD
10-3/4"	40.5#	K-55	C. 1,200' MD
7"	26#	N-80 & K-55	C. 7,890'
	Effective Perforations:		6,308' – 6,318', 6,356' – 6,374',
		4, 1/2 JHPF	6,390' – 6,448', 6,460' – 6,497',
			6,750' – 6,802', 6,817' – 6,856', &
			6,870' – 7,060'
		1, 1/2 JHPF	7,235' – 7,370', 7,400' – 7,550'

Post-Work Condition:

20"		Conductor	C. 52.5' MD
10-3/4"	40.5#	K-55	C. 1,200' MD
7"	26#	N-80 & K-55	C. 7,890'
	Effective Perforations:		6,308' – 6,318', 6,356' – 6,374',
		4, 1/2 JHPF	6,390' – 6,448', 6,460' – 6,497',
			6,750' – 6,802', 6,817' – 6,856', &
			6,870' – 7,060'
			6,770' – 6,790', 6,820' – 6,840',
			7,060' – 7,130', 7,240' – 7,410', &
			7,430' – 7,500'
		1, 1/2 JHPF	7,235' – 7,370', 7,400' – 7,550'

Date	Report	**HISTORY Add Additional Perforations – NOTE KB: 12.5' Elevation: 171'**
09/06/2016	01	Service rig and equipment. Move V- door into place. Power down rig. Remove South cellar beams. Skid rig to WP 30. Power up rig. Move V-door into place. N/d production tree. N/u riser and BOPE. Perform function test. Stab in jnt of 2 7/8 into donut and make it up. Secure BOPE and rig till AM. Clean up location. Traveled back to yard. EOT.
09/07/2016	02	Service rig and equipment. Preformed a weekly blow out drill. Filled backside with lease water. R/u hydro tester to backside. Pressure tested casing to 2000 psi. Held and charted for 15 min. The test was from existing packer @ 6256' to surface. The test was good. R/d hydro tester. Opened BOPE. Pulled up and sheared the 7" G-77 top packer. (30,000# over string weight) Dropped down to neutral weight and released the bottom 7" G-6 packer. POOH with tbg detail. Laid down packer's. Top packer looked good. The bottom packer has some slight corrosion. Closed BOPE. Secured well and rig till AM. Cleaned up location. Traveled back to yard. EOT
09/08/2016	03	Service rig and equipment. Bleed well down. Opened BOPE. M/u 2-7/8 saw tooth collar. Measure and RIH with tbg detail. XO to 2-7/8 hydro work string. Continue to RIH. Tagged soft fill @ 7471'. POOH to top of perfs @ 6300'. Closed BOPE. Secured well and rig till AM. Hooked up hoses to shaker. Cleaned up location. Traveled back to yard. EOT
09/09/2016	04	Serviced rig and equipment. Bled well down. Opened up BOPE. RIH with tbg detail with saw tooth collar on bottom. Tagged soft fill @ 7471'. R/u Kelly & injection line to backside. Established circulation. Circulated sand and fine scale to 7560'. Unable to make further progress. Chunks of scale coming over the shaker. Circulated clean @ 7560'. POOH with tbg detail. Closed BOPE. Secured well and rig till Monday. Moved equipment needed for wire line to support bay. Cleaned up location. Traveled back to yard.
09/12/2016	05	Serviced rig and equipment. Bled well down. Opened up BOPE. R/u wire line equipment. M/u logging tool. RIH Ran a gamma-ray and CCL correlation log from 7530' to 5600'. Sent logs to engineer. POOH R/u xo spool and lubricator. Spotted perf guns in the V-door for first run. RIH with 4" OD gun. Stacked out @ 7500' (assume scale build up) Shot 4, ½" JHPF in intervals as follows: 7500'-7430', 7410'-7360'. POOH. Closed BOPE. Secured well and rig till AM. Cleaned up location. Traveled back to yard. EOT

09/13/2016	06	Serviced rig and equipment. Bled well down. Opened up BOPE. Continued to M/u 4" OD perf guns and RIH. Shot 4, ½" JHPF 25 gram charges across remaining perf intervals, left out interval 7520'-7500' (20') due to scale. **Total intervals shot are as follows. 7500'-7430'(70'), 7410'-7240'(170'), 7130'-7060'(70'), 6820'-6840'(20'), 6770'-6790'(20').** Total 350'. R/d wire line and equipment. Measured and M/u 7" all weight scraper and bumper sub. RIH with tbg detail. Worked scraper down to 7528'. POOH to top of perfs @ 6300'. Closed BOPE. Secured well and rig till AM. Cleaned up location. Traveled back to yard. EOT
09/14/2016	07	Serviced rig and equipment. Opened up well. No pressure. Opened up BOPE. Continued to POOH with scraper. Laid down scraper. Noticeable scale on blades of scraper. Closed BOPE. Secured well and rig till AM. Cleaned up rig floor. PU 2 jnt of 3-1/2" tbg in support bay ready for cup run tomorrow. RU Baker tank valves for acid wash. Traveled back to yard. EOT
09/15/2016	08	Serviced rig and equipment. Loaded acid wash cup tools from support bay to V-door. M/u 7" cup wash tool with 60-foot spacing between cups. RIH with tbg detail to 6250'. Closed BOPE. Stripped on PGSR spool. Secured well and rig till AM. Cleaned up location. Spotted MTS trucks in support bay. Traveled back to yard. EOT
09/16/2016	09	Serviced rig and equipment. Bled well down. Opened up BOPE. Continued to RIH with 7" wash cups and tbg detail. R/u MTS acid wash trucks. Held safety meeting. Tested lines to wellhead to 2500 psi. Spaced out tbg detail to correspond with program. Pumping 20 gals per foot (7 gpf HCl, 13 gpf HCl/HF and then 7 gpf NH4Cl) Acid Wash stations are as follows; 7440'-7500' Starting pressure 1000 psi ending 935 psi. Rate pumped 1.5 BPM 7400'-7460' Starting pressure 1045 psi ending 1040 psi. Rate pumped .20 BPM. (tight) 7340'-7400' Starting pressure 1040 psi ending 1040 psi. Rate pumped .90 BPM (tight) 7280'-7340' Starting pressure 1045 psi ending 950 psi. Rate pumped 1.0 BPM 7220'-7280' Starting pressure 850 psi ending 850 psi. rate pumped 1.2 BPM 7070'-7130' Starting pressure 750 psi ending 800 psi. Rate pumped 1.8 BPM 7010'-7070 Starting pressure 1000 psi ending 775 psi. Rate pumped 1.8 BPM 6830'-6900' Starting pressure 1025 psi ending 1025 psi. Rate pumped 1.0 BPM 6770'-6830' Starting pressure 900 psi ending 900 psi. Rate pumped 1.8 BPM. Displaced 50 bbls lease water down tbg and 300 bbls down casing. R/d MTS Trucks and hoses. POOH with 7" wash cup tools and tbg detail. Left 15 stands in the hole. Closed BOPE. Hooked back side to P9. Well will be monitored by production over the weekend. Cleaned up rig floor. Traveled back to yard. EOT
09/19/2016	10	Serviced rig and equipment. Bled well down. Small 5 second blow. Opened up BOPE. Continue to POOH. Laid down excess tbg and 7" acid wash cup tool. R/u Aguilar Hydro tester. M/u 7" 26# Weatherford ultra-lock set packer. RIH with tbg detail. Tested all tbg to 5000 psi. Had no failures. R/d hydro tester. Closed BOPE. Secured well and rig till AM. Cleaned up location. Traveled back to yard. EOT
09/20/2016	11	Serviced rig and equipment. Bled well down. M/u donut. RIH and landed tbg detail on donut. N/d BOPE. Dumped packer fluid down backside. Set 7" lock set packer. Center of element 6200'. Landed tbg in compression (15,000). R/u Aguilar Hydro tester to backside with a chart to test the casing and packer. Tested casing from 6200' to surface. Charted and held 2000 psi for 30 minutes. Called DOGGR to witness. Scheduled test with DOGGR for 8:00 AM. Bled off pressure. Secured well and rig till AM. Cleaned up location. Traveled back to yard. EOT.
09/21/2016	12	Traveled to location and held safety meeting with rig crew. Serviced rig and equipment. Bled well down. R/u Hydro tester and chart. Pressure up casing to 2000 psi. In 30 minutes bled down to 1950 psi then held solid at 1950 for 15 minutes. Good test. M. Cannon from the DOGGR office was here to witness and sign off on the test. The test on casing was from 6200' (center of packer) to surface. Bled off pressure. R/d hydro tester. R/u production tree and injection line. Turned well over to injection. Cleaned up rig floor. Traveled back to yard. EOT

WP 30 Wellbore Diagram

API No. 040372103500
Spud Date: 5/29/1970
Sec.30, Twn 1S, Rge 14W

KB = 12.5'
Elevation = 171'
TD 7890'
PD 7635' - 7708'
7773' - 7818'

Current Condition: 5/28/2014
Injector
Avg. 2015 bwipd = 1,955
MASP: 2483

MD	TVD	Dip	
0		0	
100	100.0	0.17	**20" Conductor Cmtd@52.5'**
200	199.9	3.27	
300	299.4	8.12	
400	397.8	12.13	
500	495.3	13.76	
600	592.1	14.33	
700	688.6	15.86	
800	784.6	16.34	**BFW & USDW above 845' based on EarthQuest Report 1/20/14**
900	880.6	16.77	
1000	976.2	17.73	
1100	1071.4	18.0	**10-3/4" 40.5# K-55 15" Hole Surface to 1200' cmtd w/760 sx "G" 1200'**
1200	1167.1	17.0	
1300	1262.5	17.91	
1400	1357.6	18.45	**2 7/8" Tubing 6.4# N-80 (ID = 2.441", Drift = 2.347")**
1500	1452.5	17.34	
1600	1547.7	17.0	
1700	1643.4	16.86	
1800	1739.6	15.45	
1900	1836.1	14.44	
2000	1932.9	15.14	
2100	2029.8	13.56	
2200	2126.8	14.45	
2300	2223.8	14.62	
2400	2320.5	15.0	
2500	2417.0	15.29	
2600	2513.3	15.52	
2700	2609.4	16.17	
2800	2705.4	15.44	
2900	2801.5	15.57	
3000	2897.9	15.0	
3100	2994.3	16.13	
3200	3090.7	16.11	
3300	3187.3	15.71	
3400	3284.0	14.0	
3500	3380.8	14.33	
3600	3477.8	13.06	
3700	3575.0	14.18	
3800	3672.3	13.36	
3900	3770.0	14.1	
4000	3867.4	14.2	
4100	3967.5	14.8	
4200	4059.6	13.8	
4300	4157.1	13.3	
4400	4254.5	13.3	
4500	4352.0	13.3	
4600	4449.7	12.8	
4700	4547.4	12.3	
4800	4645.1	12.6	
4900	4743.0	11.2	
5000	4840.9	11.0	
5100	4938.3	11.0	
5200	5037.1	9.9	
5300	5136.3	7.5	
5400	5235.5	6.1	
5500	5334.9	6.7	
5600	5434.1	7.7	
5700	5533.2	8.5	**Repetto @ 5775'**
5800	5633.2	9.2	
5900	5729.5	10.1	
6000	5828.3	11.7	**Dunsmuir Sand @ 6050'**
6100	5926.7	14.0	
6200	6020.2	17.3	WSO Holes: 11", 7" csg 4 holes @ 6280'
6300	6113.7	20.6	**Hauser @ 6300'**
6400	6205.0	24.5	
6500	6293.0	29.5	
6600	6377.9	33.6	
6700	6455.8	34.5	
6800	6544.7	34.8	
6900	6616.5	34.7	
7000	6713.5	34.6	
7100	6801.0	35.0	
7200	6884.4	35.1	
7300	6959.4	35.5	
7400	7035.8	35.7	CP @ 7635' - 7713'
7500	7106.4	35.5	Ineffective Perfs 11" sqzd off w/cmt: 7527'; WSO Holes 11" sqzd off w/ cmt: 7559'
7600	7200.0	34.8	Ineffective Perfs 11" sqzd off w/cmt: 7672' - 7708'; WSO Holes 11" sqzd off w/ cmt: 7713'
7700	7300.0	34.8	
7800	7350.0	34.8	**7" 26# N-80 & K-55 9-7/8" hole cmtd w/1386 cuft "G", 450 cuft Pozzolan "D"**
7890	7440.1	34.8	**(1205 sx "G")**

Descrip.	Joints	Length	Depth
Compression		-1.87	-1.87
KB		23.00	21.13
Hanger		1.00	22.13
2-7/8" N-80 tubing	199	6197.79	6219.92
2-7/8" 8rd X-nipple		0.94	6220.86
2-7/8" 8rd joint	1	30.69	6251.55
7" G-77 Hyd Packer		**5.01**	**6256.56**
2-7/8" 8rd N-80 tubing	29	917.98	7174.54
2-7/8" 8rd X-nipple		0.94	7175.48
2-7/8" 8rd joint	1	32.70	7208.18
7" G-6 Mech. Packer	**24**	**4.14**	**7212.32**
2-7/8" 8rd joint	1	32.72	7245.04
2-7/8" 8rd XN-nipple		1.41	7246.45
2-7/8" 8rd catcher sub		0.54	7246.99
2-7/8" 8rd bell collar		0.44	7247.43

Est. TOC @ 3960'

Pkr @ 6256.56'

Perforations [4 JHPF]: 6308' - 6318'; 6356' - 6374'
6390' - 6448'; 6460' - 6497'

Perforations [4 JHPF]: 6750' - 6802',6817'-6856',6870'-7060'

WSO Holes: 11", 7" csg 4 holes @ 7150'

Perforations [1-1/2" SPF]: 7235'-7370',7400'-7550'

Pkr @ 7212.32'

CP @ 7635' - 7713'
CP @ 7773' - 7818'
TD = 7890'

HISTORY

5/29/1970:	Spudded well
6/1/1970:	Ran 32 joints (1204.76') of 10-3/4" w/ guide shoe @1200'; baffle plate @ 1160'
6/15/1970:	Ran OH Logs: 1200' to 7065'
6/16/1970:	Ran Four-Arm High Resolution Continuous Dipmeter: 3000' - 7058'
6/16/1970:	Ran Schlumberger sidewall sample (30) @: 4110', 4138', 4147', 4171', 4197', 4229',4248',4254',4285',4325',4358',4383',4410',4436',5048',5089',5113',6308', 6356', 6366', 6462', 6486', 6531', 6784', 6825', 6848', 6900', 6933', 6976', 7025'
6/21/1970:	Ran OH Logs: 3900' to 7894'
6/21/1970:	Ran Four-Arm High Resolution Continuous Dipmeter: 5500' - 7890'
6/22/1970:	Ran Schlumberger sidewall sample(23): 4144',4227',4250',4283',4311',5009', 5094'-7062',7085',7106',7128',7255',7288',7370',4764',7498',7526',7632',7680', 7734',7760',7797',7878'
6/23/1970:	Ran 187 joints (7820.24' on hook) w/ Baker guide shoe @ 7818'
6/26/1970:	Ran OH Logs: 3500' - 7486'
6/27/1970:	Ran OH Logs: 7114' - 7780'
6/29/1970:	Squeeze #1 & #1A(7526' -7527') Ran & set Halliburton EZ drill retainer @7470'
6/30/1970:	Ran Go Int'l steel carrier gun; jet perf 4 holes 7"csg@**7559'** (Dual Ind.- Laterolog)
6/30/1970:	WSO #3 (7559') Ran Halliburton tester; set 5-3/4" packer @ 7539' to 7560'
6/30/1970:	Ran Go Int'l steel carrier gun; jet perf 4 holes 7"csg@ **7713'** (Dual Ind.- Laterolog)
6/30/1970:	WSO #4 (7713') Ran Halliburton tester; set 5-3/4" packer @ 7682' to 7704'
7/1/1970:	Ran Go Int'l steel carrier gun;4 JHPF 7" csg 7672' -7708' (Dual Ind.- Laterolog)
7/2/1970:	Squeeze #2 (7672'-7708') Ran and set Halliburton EZ drill retainer @ 7500'
7/3/1970:	Completed jet perf in 7" csg with 4 hpf: 6308' - 6318'; 6356 - 6374', 6390'-6448,6460' - 6497'; 6750' - 6802'; 6817' - 6856'; 6870'-7060'
7/9/1970:	Placed well on production; **IP after 30 days 409 bopd, 26.0 API, 127 Mcf/day**
10/15/1980:	**Began coversion to injector**
10/16/1980:	Attempt to remove 2 7/8" tbg stuck until 10/21/1980; scale in tbg; flush w/ HCl
11/8/1980:	**Fish left in hole; top @ 7177'** **2-7/8", Type "B", Kobe BHA w/ 1 joint, 2" cut off of 2-7/8" tubing**
11/10/1980:	RIH Brown Oil Tool M1 packer: 6184.63' - 6189.43' National seal-lock tubing & 134 joints 2-7/8" N-80, 8rnd tubing
11/10/1980:	**Completed converting producer to water injection well**
12/17/1980:	Ran Spinner, Temp., Differential Temp., and RA Tracer packer check to 7125'; injection fluid below 6308'
2/26/1985:	Injected crosslinking polymer to divert water from H10 sand to H00 sand
11/21/1985:	**Inject Polymer-Augmented Waterflood to divert wtr from H10 to H00 sand**
11/26/1985:	Completed Polymer-Augmented Waterflood injection
11/6/2002:	Eliminate Casing Pressure; chemical corrosion inhibitor; remove scale
4/21/2006:	Installed new Elco Wellhead csg valves
4/25/2006:	Tiger perforated 7" csg: 7235' to 7370'; 0.5 holes & 26.53 penetration
4/27/2006:	MU TIH w/ Halliburton 7" G-6 injection packer, 7" G-77 injection packer in new 2-7/8" 8rd J-55 tbg
1/31/2012:	Released G-6 and G-77 injection packers; tubing/packer leak; holes on joints
2/3/2012:	Drilled sand and scale to 7490' to top of cement; drilled cement to 7540' Found joint #54 parted 10' from collar
2/7/2012:	Excessive corrosion; cleaned drill collars; new hydrill tubing to 5500'
2/15/2012:	Perforated 7400' to 7550' PU & ran Halliburton G-6 mechanical packer below 950' new N-80 tubing; G-77 hydraulic packer followed by new N-80 tubing
2/17/2012:	Returned to injection

02/02/2021

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

PROJECT DATA UPDATE FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

As you likely know, applicable regulations require the operator of an underground injection project to maintain on file with the California Geologic Energy Management Division (CalGEM) a variety of supporting data. These data are necessary for CalGEM's ongoing evaluation of the project's continued safe operation in compliance with current standard requirements and any pertinent project-specific conditions. For that reason, these same regulations require that the operator ensure these supporting data remain updated for accuracy and completeness throughout the operational life of the project. (Cal. Code Regs., tit. 14, § 1724.7.)

In light of recent changes to applicable regulatory requirements for underground injection projects, including various elements of required supporting data, CalGEM believes it will be necessary for you to provide a complete updated package of supporting data for the above-identified project. This update would include, at minimum, materials satisfying all the project data requirements identified in California Code of Regulations, title 14, section 1724.7, but also potentially other data elements critical for evaluation by CalGEM's regulatory partners at the State Water Resources Control Board and Regional Water Quality Control Boards. To facilitate timely review by CalGEM staff, and to best meet regulatory objectives, these materials should be filed with CalGEM through the WellSTAR program whenever possible. To assist with your assembly and submission of necessary supporting data, I have enclosed a copy of the current "UIC Project Information Checklist" (Appendix Attachment 2) from the Revised Memorandum of Agreement regarding underground injection control between the State Water Resources Control Board and CalGEM. While not exhaustive or a substitute for familiarity with applicable law, this checklist can be a helpful reference tool.

At your earliest convenience, please contact me via the email or phone number listed below to schedule a meeting for some time within the next 30 days, during which CalGEM and operator representatives will discuss in more detail expectations regarding this project data update, including a timeline for when the update will be completed.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion.

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-4400 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Dale Peterson

Dale Peterson
Engineering Geologist
Geologic Energy Management Division (Southern District)

Enclosure: UIC Project Information Checklist

cc: Project File

UNDERGROUND INJECTION CONTROL (UIC)
GEOLOGIC ENERGY MANAGEMENT DIVISION
PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The tables below summarize in checklist form the shared understanding of the Division and the Water Boards regarding the anticipated typical content and format of the project information to be forwarded from the Division to the Water Boards in connection with review of underground injection projects, as described in the Section IV.B. of the Revised Memorandum of Agreement, signed July 2018.

Note that this checklist does not necessarily identify all information an operator must provide to the Division in connection with an approval and ongoing operation of an underground injection project. The requirements for approval and operation of underground injection projects are governed by applicable statutes and regulations. This checklist is not a substitute for those requirements.

Project Category (Project by Project, Periodic Review, New Project, Expansion, Modified Project)**:**
Project Type (Water Disposal, Gas Disposal, Water Flood, Cyclic Steam, Steam Flood)**:**
Number of Wells:
Operator:
Project No.:
Field Name:
Direct Injection Zone(s):
Indirect Migration Injection Zone(s):
DOGGR Reviewing Engineer:
Date Project Submitted:

Unless otherwise indicated, all authority references in the tables below are to sections within California Code of Regulations, title 14.

			Reference Authority	Complete	Location in the Data Package	Operator Notes Supporting / Clarifying Data Presented	Reviewed	CalGEM Notes
Data Format	DF(1)	All data supporting the underground injection project are in a digital format. *The Division and the Water Boards recognize that converting the Division's existing project files to a digital format is an ongoing process. The Division will work with the Water Boards to determine the most appropriate format for the data on a case-by-case basis.*	1724.7(c)	☐			☐	
	DF(2)	All maps, diagrams, and exhibits are clearly and appropriately labeled, such as to title, scale, and purpose, and clearly identify wells, boundaries, zones, contacts, and other relevant data.	1724.7(c)	☐			☐	
Cover Page	CP(1)	A cover page including a statement that appropriate licensed professionals, whose signatures and stamps appear at the bottom of the page, are responsible for all data, interpretations, and calculations, if any, subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1. If the operator determines that the submission does not include data, interpretations, or calculations subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1, the cover page must so indicate, and must provide the name(s) and signature(s) of the individual(s) responsible for preparing the submission.	1724.7(d)	☐			☐	
Engineering Study	ES(1)	A description of how the area of review was determined, including calculations, variables, citations, and assumptions. *The Division and Water Boards agree the AOR determination should include injection and production impacts of offset projects that could potentially interact with the proposed project, with due consideration for the geology, engineering aspects, and the nature of injected fluids.* *The Division may use the rates, pressures, and volumes included in the calculations as conditions of the Project Approval Letter. For water disposal projects, a determination of the current injectate front and pressure front also may be an important part of the area of review determination.*	1724.7(a)(1)(A)	☐			☐	
	ES(2)	A map of the area of review showing the location of the following: (1) All wells within and adjacent to the boundary of the area of review; (2) All water supply wells that are within the area of review and identified in public records or otherwise known to the operator; (3) Any underground disposal horizons, mining, and other subsurface industrial activities not associated with oil and gas production within the area of review, to the extent such information is publicly available or otherwise known to the operator; and (4) Traces of the geologic cross sections provided as part of the Geologic Study. *The historical term 'project area' may be shown as the map view projection of the injection zone defined in 1720.1(g). The 'project area' can include a single area of review (AOR), multiple AORs, or any overlapping cumulative effects of the AORs.*	1724.7(a)(1)(B) 1724.8	☐			☐	
	ES(3)	A compendium of the following information: (1) For all wells depicted in the map of the area of review (including water supply wells to the extent information is known or publicly available), the API numbers, or other identifying information for wells that do not have API numbers, and the wellbore paths, total depths, and depths of completion interval(s) of the wells; (2) The type and status of water supply wells depicted in the map of the area of review; and (3) All the casing diagram data specified in Section 1724.7.1, provided in the form of graphical casing diagrams or flat-file data sets, for all wells that are within the area of review and that are completed in or penetrating the injection zone for the underground injection project or a deeper zone, including directionally drilled wells that intersect the area of review in the injection zone or a deeper zone.	1724.7(a)(1)(C) 1724.7.1 1724.8	☐			☐	

	ES(4)	The planned well-drilling and plugging-and-abandonment program to complete the project, including a flood-pattern map, if applicable, showing all injection, production, and plugged and abandoned wells, and unit boundaries. *The Division recognizes plans are subject to change during the course of a project review. It is the operator's responsibility to update project data accordingly prior to approval.*	1724.7(a)(1)(D) 1724.8	▫			▫	
Geologic Study	GS(1)	Geologic information describing the reservoir characteristics of the injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations. The scope of the geologic characterization shall encompass the caprock and sealing mechanisms, the injection zone including the vertical interval above and below the approved injection zone, and the areas where potential migration of fluid or entrapment of migrated fluid could occur. *The Division and Water Boards agree all supporting data shall be the most current, accurate and relevant. All data sources shall be cited.*	1724.7(a)(2)(A)	▫			▫	
	GS(2)	Reservoir fluid data for the injection zone, such as oil gravity and viscosity, water quality, presence and concentration of non-hydrocarbon components in the associated gas (such as hydrogen sulfide) and specific gravity of gas. Liquid analysis of the reservoir fluid shall be performed in accordance with Section 1724.7.2. *The Division and Water Boards agree supporting documentation for formation fluid TDS determination should be included and from actual samples when available. Supporting documents may include, but are not limited to, historic data, properly documented log derivations, and when available, submission of LAS logs and all constants used for verification.*	1724.7(a)(2)(B) 1724.7.2	▫			▫	
	GS(3)	Structural contour map drawn on a geologic marker at or near the top and base of each injection zone in area of review, indicating faults and any lateral containment features. If faults are identified, there must also be analysis addressing whether or not the faults are capable of confining fluid to the approved injection zone and any geologic features that could result in the migration of fluid out of the approved injection zone. *If a GIS shapefile is submitted, layers with labeled wellbore paths of all existing and proposed wells in the map area would lead to a more comprehensive understanding of the system.*	1724.7(a)(2)(C)	▫			▫	
	GS(4)	Isopach map of each injection zone or subzone in the area of review.	1724.7(a)(2)(D)	▫			▫	
	GS(5)	At least two geologic cross sections in the area of review through at least three wells, including one injection well. As near as possible, one of the geologic cross sections shall be along strike and the other shall be perpendicular to strike. The cross section shall extend from the base of the deepest production or injection zone to surface and indicate the location of the approved injection zone, the base of freshwater, and the base of the USDW.	1724.7(a)(2)(E)	▫			▫	
	GS(6)	Representative electric log to a depth below the deepest producing or injection zone, whichever is deeper, identifying all geologic units, formations, USDWs, freshwater aquifers, and oil or gas zones. The electric log shall identify the API number of the well that was logged.	1724.7(a)(2)(F)	▫			▫	
Injection Plan	IP(1)	A statement of primary purpose of the project.	1724.7(a)(3)(A)	▫			▫	
	IP(2)	A map showing injection facilities related to the project, and piping and instrumentation diagram(s) for the injection facilities.	1724.7(a)(3)(B)	▫			▫	
	IP(3)	A statement of the anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected. *The Division and Water Boards anticipate this data to be based on maximum values.*	1724.7(a)(3)(C)	▫			▫	
	IP(4)	Identification of all wells that are part of the project, including injection wells, affected production wells, water source wells, observation or other wells and any planned wells to the extent known. The depths of water source wells shall also be provided.	1724.7(a)(3)(D)	▫			▫	
	IP(5)	Monitoring system, including methods or standard operating procedures to be utilized by the operator to ensure that no damage is occurring and that the injection fluid is confined to the approved injection zone. In the event the Division or the Water Boards require groundwater monitoring in relation to the underground injection project, or as a condition of project approval, the operator shall consult with the State Water Resources Control Board or the Regional Water Quality Control Board and provide the Division with documentation and the results of such consultation.	1724.7(a)(3)(E)	▫			▫	
	IP(6)	A description of the method of injection, including such information as injection string configuration and bottom-hole assembly.	1724.7(a)(3)(F)	▫			▫	
	IP(7)	A list of the cathodic protection or other corrosion prevention measures employed for plant, lines, and wells, if such measures are warranted.	1724.7(a)(3)(G)	▫			▫	
	IP(8)	Identification of the source(s) of the injection fluid and analyses of the injection fluid in accordance with Section 1724.7.2.	1724.7(a)(3)(H) 1724.7.2 *NTO- Guidelines for Collection of Oilfield Water Quality Data*	▫			▫	

Other Standard Information	OI(1)	All data supporting the determination of the maximum allowable surface injection pressure for each injection well in the underground injection project, as described in Section 1724.10.3, including all calculations, variables, citations and assumptions.	1724.7.(a)(4) 1724.10.3	▫			▫	
	OI(2)	Copies of letters of notification sent to offset operators by the operator of the underground injection project.	1724.7(a)(5)	▫			▫	

Situational Information	SI(1)	Any other data that, in the judgement of the Division, are pertinent and necessary for the proper evaluation of the underground injection project. Examples of such data are: isochore maps, isogor maps, water-oil ratio maps, isobar maps, three-dimensional geologic models, reservoir simulation results, isopach maps of the confining layers, equipment diagrams, and safety programs.	1724.7(a)(6)	▫			▫	
	SI(2)	Any alternative data accepted by Division in lieu of the default regulatory requirements for project data, as described in Section 1724.7(e).	1724.7(e)	▫			▫	
	SI(3)	For an underground injection project that includes an injection well with open perforations located within 500 linear feet of the screen or perforations of a water supply well (or a project otherwise required to provide this information as determined by the Division), all of the following information, updated yearly: (1) A water treatment process flow diagram depicting all physical and chemical treatment processes applied to the injection fluid, from its source to the injection well; (2) The safety data sheet for each chemical additive emplaced in injection wells within the underground injection project, and for each chemical added to the fluid to be injected from the time the fluid is first obtained to the time it is injected; (3) The project-aggregate volume or weight of each additive reported; and (4) A brief description of the intended purpose of each additive reported.	1724.10(e)	▫			▫	

UNDERGROUND INJECTION CONTROL (UIC)
WATER BOARDS PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The table below summarizes in checklist form the supplemental information required in addition to that listed in the Application checklist that the Water Boards need for review of underground injection projects.

The information requested below is made in lieu of requiring operators to file a report of discharge under California Water Code section 13260 and is consistent with authority provided in Water Code sections 13260, 13267, and 13267.5.

		To help expedite the Water Board's review, please identify the exact WellStar location of the data indicated below.	**Complete**	**Location in the Data Package**	**Operator Notes Supporting / Clarifying Data Presented**	**Reviewed**	**Water Board Notes**
Water Boards	W-CP	For ALL project reviews, the application must include a statement and supporting rationale demonstrating that injected Class II fluids have not (for ongoing projects) and will not (for any project) migrate beyond the boundaries of the exempt aquifer or into a underground source of drinking water (USDW). Any evaluation of past, or anticipated future, migration of injected fluids involving geologic or engineering interpretation must be conducted by, or under the direct supervision of, a state-registered professional geologist or professional engineer and signed and stamped by a registered professional to the extent required by California Business and Professions Code sections 6735, 7835, and 7835.1.	▫			▫	
	W-ES(1)	Provide the rationale for determining the area of review (AOR) with supporting calculations; including the assumptions associated with the calculations. A range of values used to determine average porosity, permeability, and thickness (net and gross) will be provided with the supporting data. The anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected will be provided.	▫			▫	
	W-ES(2)	For all projects, AOR calculations must use an accurate representation of all the relevant parameters from within the project area, including the static pressures or current temperatures of the injection zone(s) and USDW(s) within the AOR. If a range of values for the input parameters is provided, then multiple AORs need to be calculated to provide the most conservative estimate of the distance injected fluids may migrate. This procedure will provide assurance that, if proposed, an AOR of one quarter-mile fixed radius is adequate. The analysis shall consider the heterogeneity of the reservoir. Operator must declare if the formations are homogeneous or heterogeneous. *A ZEI calculation may meet the regulatory requirements of AOR calculation.*	▫			▫	
	W-ES(3)	Provide an evaluation of any potential increase in reservoir pressure and fluid migration due to either overlapping ZEIs, neighboring injection projects, or other relevant inputs into the system (i.e. faults, facies changes and stratigraphic pinchouts that may act as flow barriers). If the change in reservoir pressure due to injections will be reduced by production wells, the Operator will submit calculations that show how the change in reservoir pressure will be offset by the production wells. Injection and production wells used in this evaluation should be identified on the application maps/figures.	▫			▫	
	W-ES(4)	The map of the AOR provided to will also include the following: (1) for all wells; include surface and bottom hole locations and labels that display their well type and status (e.g. active steamflood injector); (2) all faults within the Project Area, and (3) all wells that have been identified as potential conduits to a USDW.	▫			▫	
	W-ES(5)	Well construction diagrams for all wells and boreholes within the AOR need to be provided. Each diagram will identify the depth and perforated interval of the well and borehole, cement plugs, casing damage, key geologic markers (e.g. injection zone), BFW, and USDW. Each well and borehole diagram should depict the entire history (e.g. sidetracks, redrills, and other mechanical changes).	▫			▫	
	W-ES(6)	Provide a water well survey. Water well locations within one mile of the project area shall be presented on a map and listed in an accompanying table. The water well survey should utilize the following data sources (at a minimum): Department of Water Resources (DWR) well completion reports and GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) information system. The following information will be included in the table: location information, type (municipal, domestic, irrigation, industrial, stock), status (active, idle, abandoned, destroyed), owner, well completion depth and zone name, and depths for all screened intervals. On a case-by-case basis, an expanded water well survey may be necessary based upon potential risk to beneficial use water outside the limits of the AOR. For those well completion reports that do not provide the latitude and longitude coordinates, the Operator should attempt to determine its location by a field survey.	▫			▫	
	W-GS(1)	All supporting maps (e.g. structural contour map) need to include the AOR and Project Area, existing exemption boundaries, faults (with displacement information), lines of cross-section, a scale, an explanation describing what the symbols and colors used represent, north arrow, and identify the name of formation or unit mapped. Also, structural contour and isopach maps of the upper and lower "confining" units need to be provided. Representative permeability and porosity values, if available, of the "confining" units should be labeled on these maps. The cross sections need to include the AOR(s), the proposed injection zone, confining units, the formation or units penetrated by injection wells with associated API numbers, water supply wells, locations of the base of fresh water (BFW) and USDW, deviated wells within the line of section (i.e. wells near the cross-section trace), and an explanation describing what colors and symbols mean.	▫			▫	
	W-GS(2)	The type log provided will include labeled geophysical curves and a vertical scale. The method and data used to determine the base of USDW should be included in the application.	▫			▫	

W-GS(3)	Provide representative water quality data (collected within the past 5 years) of the injection zone from well(s) located within the AOR. The injection zone groundwater analysis should be representative of the reservoir groundwater in its native condition. The groundwater analyzed shall be either sampled from the injection zone itself prior to commencement of any injection into the reservoir or sampled from an analogous reservoir that has not already received injection fluid. The representative sample shall be recovered after all completion and drilling fluid has been circulated from the wellbore. Any proposed groundwater sampling and analysis proposed for new or modified projects must follow the most recent version of the Notice to Operators – Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-GS(4)	If the injection zone is not an exempted aquifer, then a non-USDW determination shall be made using recent (collected within the past 5 years) water quality samples of the injection zone groundwater within the Project Area. If no wells exist within the Project Area, then total dissolved solids (TDS) well log calculations can be used provided that: 1) The accuracy (i.e. percent error) of the computed result is validated with a water quality sample of the same injection zone groundwater within 1 mile of the project area; and 2) The method, calculations, and assumptions used in the TDS analysis are provided. If the Operator determines through water quality sampling or TDS calculations that the injection zone and/or overlying formations are non-USDWs, the lateral and vertical extent of this determination shall be defined on the application maps and cross sections.	▫			▫	
W-GS(5)	Any groundwater quality data or well log analysis that will be used to justify the injection of fluids (e.g., showing that TDS concentrations within the proposed injection zone are greater than 10,000 milligrams per liter) must be accompanied by a written statement or report, prepared by a state-registered professional geologist or professional engineer, indicating the degree to which the water quality data is representative of the injectate fluid or native formation groundwater and provide justification for that conclusion.	▫			▫	
W-IP(1)	Provide a map that shows the location of any pretreatment facilities, location of proposed injection wells and any other injection wells plumbed to the facility.	▫			▫	
W-IP(2)	Provide information including the type of treatment and plan for the disposal of reject water.	▫			▫	
W-IP(3)	Provide representative water quality data of the injectate; collected within the past year. The source of the injectate fluids should be identified including zone/formation and approximate volume percentages. The injection liquid to be analyzed shall be sampled after all additives (if any) are added to the liquid and after all treatment or separation processes (if any), to ensure that it is representative of the liquid actually injected. Sampling protocol for existing projects (project by project) should be provided. Any proposed water sampling and analysis proposed for new or modified projects should follow the most recent Notice to Operators regarding Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-IP(4)	The Aquifer Exemption (AE) conditions as outlined in State Water Board's final concurrence letters need to be addressed in the Operator's application and incorporated into the Project Approval Letters, if appropriate. Such AE conditions may include monitoring that is different than the monitoring requested at the UIC project level. Requested "groundwater monitoring" includes but is not limited to the following: water quality monitoring (e.g. of the injectate and/or groundwater within the newly exempted zone/area), temperature monitoring, and/or pressure monitoring. For those projects with potential conduits into a USDW, a proposed monitoring plan to confirm the pressure front calculations used in determining the change in pressure near problem wells or faults shall be provided.	▫			▫	
W-SI	Using recent (measured within the past 2 years) idle well fluid level data for all idle wells within the AOR, provide a map showing the apparent groundwater flow direction(s) within the injection zone. The supporting data (e.g. acoustic water level surveys) used to create the maps shall be provided.	▫			▫	

Acronyms

AE	Aquifer Exemption
AOR	Area of review
BFW	Base of fresh water
CCR	California Code of Regulations
CP	Cover Page
DF	Data Format
DWR	Department of Water Resources
ES	Engineering Study
GAMA	Groundwater Ambient Monitoring and Assessment Program
GIS	Geographic Information System
GS	Geological Study
IP	Injection Plan
LAS	Log ASCII Standard
OI	Other Standard Information
SI	Situational Information
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
WellSTAR	Well State Tracking and Reporting
ZEI	Zone of Endangering Influence

03/18/2021

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

COMPLETION DEADLINE: PROJECT DATA UPDATE FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

The California Geologic Energy Management Division (CalGEM) appreciates PCEC representatives engaging with CalGEM staff to discuss the timeline for submission of updated supporting data for the underground injection project identified above.

Based on those discussions, and on review of pertinent records on file with CalGEM, it is **CalGEM's determination** that, in satisfaction of PCEC's ongoing obligation to maintain a current and accurate assembly of important supporting data throughout the operational life of the project, PCEC will need to file with CalGEM a complete updated package of supporting data for the project in compliance with the recently revised project data requirements set forth in California Code of Regulations, title 14, section 1724.7.

CalGEM expects PCEC can and will file with CalGEM a complete package of supporting data in satisfaction of these requirements by no later than 05/15/2021. Complete, current, and accurate supporting data in a suitable format are necessary for safe and effective ongoing regulation of underground injection in compliance with current requirements,

If a satisfactory updated and complete package of supporting data is not filed with CalGEM by that date, CalGEM may modify or suspend injection approval as necessary to ensure operations are in compliance with applicable requirements and may take enforcement action to compel compliance. Such enforcement action could include imposition of civil penalties.

If you have questions or concerns regarding this matter, please contact Dale Peterson at 562-637-4400 or Dale.Peterson@conservation.ca.gov.

Philip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
03/18/2021

Sincerely,

Dale Peterson

Dale Peterson
Engineering Geologist
Geologic Energy Management Division (Southern District)

cc: Project File

05/12/2021

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

REQUEST FOR PROJECT DATA DEADLINE EXTENSION FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

On 05/05/2021, CalGEM received a request for an extension to the deadline for updating project data with regard to the UIC project 05403002. The District Deputy and his technical staff reviewed the request and **approve** the request to extend the deadline of the full data package submission to **06/11/2021**.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion by 06/11/2021. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

Philip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
05/12/2021

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-1445 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Baldev Gill

Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

09/29/2021

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

FOLLOWUP REQUEST FOR ADDITIONAL PROJECT DATA FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

After an initial review of your updated submission package, CalGEM requires additional data to support your application for project approval. These data are necessary for CalGEM's ongoing evaluation of the project's continued safe operation in compliance with current standard requirements and any pertinent project-specific conditions. For that reason, these same regulations require that the operator ensure these supporting data remain updated for accuracy and completeness throughout the operational life of the project. (Cal. Code Regs., tit. 14, § 1724.7.) Additional data needed for this project review include as follows:

- All information indicated in the CalGEM notes column of the attached Project Information Checklist

In order to facilitate a timely review by CalGEM staff, and to best meet regulatory objectives, these materials should be filed with CalGEM through the WellSTAR program whenever possible.

Philip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
09/29/2021

CalGEM requests that the additional data request be submitted by 10/14/2021.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-1445 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Baldev Gill

Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

UNDERGROUND INJECTION CONTROL (UIC)
GEOLOGIC ENERGY MANAGEMENT DIVISION
PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The tables below summarize in checklist form the shared understanding of the Division and the Water Boards regarding the anticipated typical content and format of the project information to be forwarded from the Division to the Water Boards in connection with review of underground injection projects, as described in the Section IV.B. of the Revised Memorandum of Agreement, signed July 2018.

Note that this checklist does not necessarily identify all information an operator must provide to the Division in connection with an approval and ongoing operation of an underground injection project. The requirements for approval and operation of underground injection projects are governed by applicable statutes and regulations. This checklist is not a substitute for those requirements.

Project Category (Project by Project, Periodic Review, New Project, Expansion, Modified Project):
Project Type (Water Disposal, Gas Disposal, Water Flood, Cyclic Steam, Steam Flood):
Number of Wells:
Operator:
Project No.:
Field Name:
Direct Injection Zone(s):
Indirect Migration Injection Zone(s):
DOGGR Reviewing Engineer:
Date Project Submitted:

Unless otherwise indicated, all authority references in the tables below are to sections within California Code of Regulations, title 14.

			Reference Authority	Complete	Location in the Data Package	Operator Notes Supporting / Clarifying Data Presented	Reviewed	CalGEM Notes
Data Format	DF(1)	All data supporting the underground injection project are in a digital format. *The Division and the Water Boards recognize that converting the Division's existing project files to a digital format is an ongoing process. The Division will work with the Water Boards to determine the most appropriate format for the data on a case-by-case basis.*	1724.7(c)	▫			▫	
	DF(2)	All maps, diagrams, and exhibits are clearly and appropriately labeled, such as to title, scale, and purpose, and clearly identify wells, boundaries, zones, contacts, and other relevant data.	1724.7(c)	▫			▫	Maps do not include legend, direction indicator, scale indicator,
Cover Page	CP(1)	A cover page including a statement that appropriate licensed professionals, whose signatures and stamps appear at the bottom of the page, are responsible for all data, interpretations, and calculations, if any, subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1. If the operator determines that the submission does not include data, interpretations, or calculations subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1, the cover page must so indicate, and must provide the name(s) and signature(s) of the individual(s) responsible for preparing the submission.	1724.7(d)	▫			▫	
Engineering Study	ES(1)	A description of how the area of review was determined, including calculations, variables, citations, and assumptions. *The Division and Water Boards agree the AOR determination should include injection and production impacts of offset projects that could potentially interact with the proposed project, with due consideration for the geology, engineering aspects, and the nature of injected fluids.* *The Division may use the rates, pressures, and volumes included in the calculations as conditions of the Project Approval Letter. For water disposal projects, a determination of the current injectate front and pressure front also may be an important part of the area of review determination.*	1724.7(a)(1)(A)	▫			▫	AOR determined volumetrically. Volumetric calculations included, Assumptions not provided. Source for porosity value not provided (no citations) Is there a typo in formula? Is 3.14149 supposed to be pi? Need the equation provided in mathematical notation, not Excel notation. Pressure transient calculations (Bernards eqn) and discussion indicate net positive fluid input to reservoir. Pressure differences and pressure wave of net positive input are not taken into account in volumetric calculation for ZEI. If pressure changes have no effect, must provide evidence. Need table of variables used in pressure transient calculations .Need sample calculations. Transient calculations should be based on current reservoir pressure and rock data. Data in Appendices from 1967 +/-. What are current pressure changes in the reservoir? Only historical changes provided. What is current trend of reservoir pressure? How will it be monitored and managed? Permeability type not indicated. Require effective permeability. Permeability data from cores does not indicate whether it is air or effective or how it was derived.
	ES(2)	A map of the area of review showing the location of the following: (1) All wells within and adjacent to the boundary of the area of review; (2) All water supply wells that are within the area of review and identified in public records or otherwise known to the operator; (3) Any underground disposal horizons, mining, and other subsurface industrial activities not associated with oil and gas production within the area of review, to the extent such information is publicly available or otherwise known to the operator; and (4) Traces of the geologic cross sections provided as part of the Geologic Study. *The historical term 'project area' may be shown as the map view projection of the injection zone defined in 1720.1(g). The 'project area' can include a single area of review (AOR), multiple AORs, or any overlapping cumulative effects of the AORs.*	1724.7(a)(1)(B) 1724.8	▫			▫	Map of AOR embedded in main document. Not hi-res. All documents (particularly large scale ones such as maps) should be high resolution so details can be examined when zoom ratio changed in digital format. 3-D ZEI images provided. Well tracks on 3-D images not clearly defined (labeled). Illustrations do not clearly define penetration (or lack thereof) of well bores into the ZEI cylinders. Labels on diagrams are not defined, No notes regarding other underground activity. No legend or scale on embedded map. ZEI is calculated as a function of volume only; pressure transient calculation shows pressure buildup over 5 years; lateral/vertical movement due to pressure increase not considered in ZEI. Need table of variables used in pressure transient calculations. Transient calculations should be based on current reservoir pressure and rock data and calculated forward.
	ES(3)	A compendium of the following information: (1) For all wells depicted in the map of the area of review (including water supply wells to the extent information is known or publicly available), the API numbers, or other identifying information for wells that do not have API numbers, and the wellbore paths, total depths, and depths of completion interval(s) of the wells; (2) The type and status of water supply wells depicted in the map of the area of review; and (3) All the casing diagram data specified in Section 1724.7.1, provided in the form of graphical casing diagrams or flat-file data sets, for all wells that are within the area of review and that are completed in or penetrating the injection zone for the underground injection project or a deeper zone, including directionally drilled wells that intersect the area of review in the injection zone or a deeper zone.	1724.7(a)(1)(C) 1724.7.1 1724.8	▫			▫	Compendium not submitted. Wellbore diagrams do not include lease name. USDW marker not labeled on some diagrams. No HC markers on WP39 RD1. Weight of mud not included for WP21 RD2. Tops and bottoms of injection zones not identified. Cement type and additives not included on diagrams. Cement calcs need to be verified. Do not match well records. Ex. Diagram for WP 26 indicates 560 sks G w/ 4% gel on surface casing, well record is 460 sks G w/ 4% gel and 100 sks neat G (different yields); Production casing calculations not on diagram; Details on squeezes of 5″ casing do not match well record, why 1.25 cf/sk assumed?. May provide calculations on separate attachment.

	ES(4)	The planned well-drilling and plugging-and-abandonment program to complete the project, including a flood-pattern map, if applicable, showing all injection, production, and plugged and abandoned wells, and unit boundaries. *The Division recognizes plans are subject to change during the course of a project review. It is the operator's responsibility to update project data accordingly prior to approval.*	1724.7(a)(1)(D) 1724.8	▫			▫	No plan provided. Only general statement that wells will be abandoned in accordance to regulations.
Geologic Study	GS(1)	Geologic information describing the reservoir characteristics of the injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations. The scope of the geologic characterization shall encompass the caprock and sealing mechanisms, the injection zone including the vertical interval above and below the approved injection zone, and the areas where potential migration of fluid or entrapment of migrated fluid could occur. *The Division and Water Boards agree all supporting data shall be the most current, accurate and relevant. All data sources shall be cited.*	1724.7(a)(2)(A)	▫			▫	Data provided is from 1967 and 1978 core analysis completed by previous operator. What is current status of reservoir? Any mechanical changes to formation from withdrawl? Permeability not indicated as air or effective. Need data for calculations of reservoir pressure. Only results of calculations provided.
	GS(2)	Reservoir fluid data for the injection zone, such as oil gravity and viscosity, water quality, presence and concentration of non-hydrocarbon components in the associated gas (such as hydrogen sulfide) and specific gravity of gas. Liquid analysis of the reservoir fluid shall be performed in accordance with Section 1724.7.2. *The Division and Water Boards agree supporting documentation for formation fluid TDS determination should be included and from actual samples when available. Supporting documents may include, but are not limited to, historic data, properly documented log derivations, and when available, submission of LAS logs and all constants used for verification.*	1724.7(a)(2)(B) 1724.7.2	▫			▫	Fluid properties from 1967 sampling. Need current. Reports do not include tests for all required constituents (K, Mn, Sr, Br, temperature, conductance). Sampling protocols not included. Depths and zones sampled? Multiple zone completions?
	GS(3)	Structural contour map drawn on a geologic marker at or near the top and base of each injection zone in area of review, indicating faults and any lateral containment features. If faults are identified, there must also be analysis addressing whether or not the faults are capable of confining fluid to the approved injection zone and any geologic features that could result in the migration of fluid out of the approved injection zone. *If a GIS shapefile is submitted, layers with labeled wellbore paths of all existing and proposed wells in the map area would lead to a more comprehensive understanding of the system.*	1724.7(a)(2)(C)	▫			▫	No lateral confining features on structure map or cross sections except anticlinal structures. Any known faults in area. If so, are faults sealing or non-sealing. What evidence if sealing.
	GS(4)	Isopach map of each injection zone or subzone in the area of review.	1724.7(a)(2)(D)	▫			▫	Only isopach for Hauser included. Need maps for both injection zones included in project.
	GS(5)	At least two geologic cross sections in the area of review through at least three wells, including one injection well. As near as possible, one of the geologic cross sections shall be along strike and the other shall be perpendicular to strike. The cross section shall extend from the base of the deepest production or injection zone to surface and indicate the location of the approved injection zone, the base of freshwater, and the base of the USDW.	1724.7(a)(2)(E)	▫			▫	Do not extend to surface. Do not indicate approved injection zones, BFW or USDW on x-sections. Cross sections and other vertical diagrams need to extend to surface and included hydrocarbon and water zones.
	GS(6)	Representative electric log to a depth below the deepest producing or injection zone, whichever is deeper, identifying all geologic units, formations, USDWs, freshwater aquifers, and oil or gas zones. The electric log shall identify the API number of the well that was logged.	1724.7(a)(2)(F)	▫			▫	USDW, BFW, oil and gas zones not identified. E-log is a composite of multiple wells. Well APIs not included. How were USDW and BFW determined? Show calculations.
Injection Plan	IP(1)	A statement of primary purpose of the project.	1724.7(a)(3)(A)	▫			▫	Statement provided is not purpose of project, it is current purpose of document. Needs to indicate the purpose of the project, not purpose of the submission. i.e. for enhanced oil production in the field...
	IP(2)	A map showing injection facilities related to the project, and piping and instrumentation diagram(s) for the injection facilities.	1724.7(a)(3)(B)	▫			▫	Flow chart submitted. Cannot determine if all piping is included. No valves indicated on map. No instrumentation included. Need schematic of facility showing all pipes, valves, tanks, vessels, etc.
	IP(3)	A statement of the anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected. *The Division and Water Boards anticipate this data to be based on maximum values.*	1724.7(a)(3)(C)	▫			▫	Injection rates/volumes based on average rates. What are average/maximum rates and pressures for each well?
	IP(4)	Identification of all wells that are part of the project, including injection wells, affected production wells, water source wells, observation or other wells and any planned wells to the extent known. The depths of water source wells shall also be provided.	1724.7(a)(3)(D)	▫			▫	Only wells listed in volumetric ZEI are included. Should other producers be included? If project is for EOR (waterflood), are the wells driving production or are they only enhancing recovery from the wells listed in the ZEI radius?
	IP(5)	Monitoring system, including methods or standard operating procedures to be utilized by the operator to ensure that no damage is occurring and that the injection fluid is confined to the approved injection zone. In the event the Division or the Water Boards require groundwater monitoring in relation to the underground injection project, or as a condition of project approval, the operator shall consult with the State Water Resources Control Board or the Regional Water Quality Control Board and provide the Division with documentation and the results of such consultation.	1724.7(a)(3)(E)	▫			▫	OK
	IP(6)	A description of the method of injection, including such information as injection string configuration and bottom-hole assembly.	1724.7(a)(3)(F)	▫			▫	OK
	IP(7)	A list of the cathodic protection or other corrosion prevention measures employed for plant, lines, and wells, if such measures are warranted.	1724.7(a)(3)(G)	▫			▫	No information provided on cathodic protection-if none, needs to be stated.
	IP(8)	Identification of the source(s) of the injection fluid and analyses of the injection fluid in accordance with Section 1724.7.2.	1724.7(a)(3)(H) 1724.7.2 *NTO- Guidelines for Collection of Oilfield Water Quality Data*	▫			▫	Source and report on samples provided. No indication of source of makeup water, though operator indicated more input than withdrawl. Samplers log w/ temperature, conductivity and pH not included in report,

Other Standard Information	OI(1)	All data supporting the determination of the maximum allowable surface injection pressure for each injection well in the underground injection project, as described in Section 1724.10.3, including all calculations, variables, citations and assumptions.	1724.7.(a)(4) 1724.10.3	▫			▫	SRT data submitted
	OI(2)	Copies of letters of notification sent to offset operators by the operator of the underground injection project.	1724.7(a)(5)	▫			▫	No letters for offset operators. Need statement if none.

Situational Information	SI(1)	Any other data that, in the judgement of the Division, are pertinent and necessary for the proper evaluation of the underground injection project. Examples of such data are: isochore maps, isogor maps, water-oil ratio maps, isobar maps, three-dimensional geologic models, reservoir simulation results, isopach maps of the confining layers, equipment diagrams, and safety programs.	1724.7(a)(6)	▫			▫	
	SI(2)	Any alternative data accepted by Division in lieu of the default regulatory requirements for project data, as described in Section 1724.7(e).	1724.7(e)	▫			▫	
	SI(3)	For an underground injection project that includes an injection well with open perforations located within 500 linear feet of the screen or perforations of a water supply well (or a project otherwise required to provide this information as determined by the Division), all of the following information, updated yearly: (1) A water treatment process flow diagram depicting all physical and chemical treatment processes applied to the injection fluid, from its source to the injection well; (2) The safety data sheet for each chemical additive emplaced in injection wells within the underground injection project, and for each chemical added to the fluid to be injected from the time the fluid is first obtained to the time it is injected; (3) The project-aggregate volume or weight of each additive reported; and (4) A brief description of the intended purpose of each additive reported.	1724.10(e)	▫			▫	No operational water supply wells located

UNDERGROUND INJECTION CONTROL (UIC)
WATER BOARDS PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The table below summarizes in checklist form the supplemental information required in addition to that listed in the Application checklist that the Water Boards need for review of underground injection projects.

The information requested below is made in lieu of requiring operators to file a report of discharge under California Water Code section 13260 and is consistent with authority provided in Water Code sections 13260, 13267, and 13267.5.

		To help expedite the Water Board's review, please identify the exact WellStar location of the data indicated below.	**Complete**	**Location in the Data Package**	**Operator Notes Supporting / Clarifying Data Presented**	**Reviewed**	**Water Board Notes**
Water Boards	W-CP	For ALL project reviews, the application must include a statement and supporting rationale demonstrating that injected Class II fluids have not (for ongoing projects) and will not (for any project) migrate beyond the boundaries of the exempt aquifer or into a underground source of drinking water (USDW). Any evaluation of past, or anticipated future, migration of injected fluids involving geologic or engineering interpretation must be conducted by, or under the direct supervision of, a state-registered professional geologist or professional engineer and signed and stamped by a registered professional to the extent required by California Business and Professions Code sections 6735, 7835, and 7835.1.	▫			▫	
	W-ES(1)	Provide the rationale for determining the area of review (AOR) with supporting calculations; including the assumptions associated with the calculations. A range of values used to determine average porosity, permeability, and thickness (net and gross) will be provided with the supporting data. The anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected will be provided.	▫			▫	
	W-ES(2)	For all projects, AOR calculations must use an accurate representation of all the relevant parameters from within the project area, including the static pressures or current temperatures of the injection zone(s) and USDW(s) within the AOR. If a range of values for the input parameters is provided, then multiple AORs need to be calculated to provide the most conservative estimate of the distance injected fluids may migrate. This procedure will provide assurance that, if proposed, an AOR of one quarter-mile fixed radius is adequate. The analysis shall consider the heterogeneity of the reservoir. Operator must declare if the formations are homogeneous or heterogeneous. *A ZEI calculation may meet the regulatory requirements of AOR calculation.*	▫			▫	
	W-ES(3)	Provide an evaluation of any potential increase in reservoir pressure and fluid migration due to either overlapping ZEIs, neighboring injection projects, or other relevant inputs into the system (i.e. faults, facies changes and stratigraphic pinchouts that may act as flow barriers). If the change in reservoir pressure due to injections will be reduced by production wells, the Operator will submit calculations that show how the change in reservoir pressure will be offset by the production wells. Injection and production wells used in this evaluation should be identified on the application maps/figures.	▫			▫	
	W-ES(4)	The map of the AOR provided to will also include the following: (1) for all wells; include surface and bottom hole locations and labels that display their well type and status (e.g. active steamflood injector); (2) all faults within the Project Area, and (3) all wells that have been identified as potential conduits to a USDW.	▫			▫	
	W-ES(5)	Well construction diagrams for all wells and boreholes within the AOR need to be provided. Each diagram will identify the depth and perforated interval of the well and borehole, cement plugs, casing damage, key geologic markers (e.g. injection zone), BFW, and USDW. Each well and borehole diagram should depict the entire history (e.g. sidetracks, redrills, and other mechanical changes).	▫			▫	
	W-ES(6)	Provide a water well survey. Water well locations within one mile of the project area shall be presented on a map and listed in an accompanying table. The water well survey should utilize the following data sources (at a minimum): Department of Water Resources (DWR) well completion reports and GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) information system. The following information will be included in the table: location information, type (municipal, domestic, irrigation, industrial, stock), status (active, idle, abandoned, destroyed), owner, well completion depth and zone name, and depths for all screened intervals. On a case-by-case basis, an expanded water well survey may be necessary based upon potential risk to beneficial use water outside the limits of the AOR. For those well completion reports that do not provide the latitude and longitude coordinates, the Operator should attempt to determine its location by a field survey.	▫			▫	
	W-GS(1)	All supporting maps (e.g. structural contour map) need to include the AOR and Project Area, existing exemption boundaries, faults (with displacement information), lines of cross-section, a scale, an explanation describing what the symbols and colors used represent, north arrow, and identify the name of formation or unit mapped. Also, structural contour and isopach maps of the upper and lower "confining" units need to be provided. Representative permeability and porosity values, if available, of the "confining" units should be labeled on these maps. The cross sections need to include the AOR(s), the proposed injection zone, confining units, the formation or units penetrated by injection wells with associated API numbers, water supply wells, locations of the base of fresh water (BFW) and USDW, deviated wells within the line of section (i.e. wells near the cross-section trace), and an explanation describing what colors and symbols mean.	▫			▫	
	W-GS(2)	The type log provided will include labeled geophysical curves and a vertical scale. The method and data used to determine the base of USDW should be included in the application.	▫			▫	

W-GS(3)	Provide representative water quality data (collected within the past 5 years) of the injection zone from well(s) located within the AOR. The injection zone groundwater analysis should be representative of the reservoir groundwater in its native condition. The groundwater analyzed shall be either sampled from the injection zone itself prior to commencement of any injection into the reservoir or sampled from an analogous reservoir that has not already received injection fluid. The representative sample shall be recovered after all completion and drilling fluid has been circulated from the wellbore. Any proposed groundwater sampling and analysis proposed for new or modified projects must follow the most recent version of the Notice to Operators – Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-GS(4)	If the injection zone is not an exempted aquifer, then a non-USDW determination shall be made using recent (collected within the past 5 years) water quality samples of the injection zone groundwater within the Project Area. If no wells exist within the Project Area, then total dissolved solids (TDS) well log calculations can be used provided that: 1) The accuracy (i.e. percent error) of the computed result is validated with a water quality sample of the same injection zone groundwater within 1 mile of the project area; and 2) The method, calculations, and assumptions used in the TDS analysis are provided. If the Operator determines through water quality sampling or TDS calculations that the injection zone and/or overlying formations are non-USDWs, the lateral and vertical extent of this determination shall be defined on the application maps and cross sections.	▫			▫	
W-GS(5)	Any groundwater quality data or well log analysis that will be used to justify the injection of fluids (e.g., showing that TDS concentrations within the proposed injection zone are greater than 10,000 milligrams per liter) must be accompanied by a written statement or report, prepared by a state-registered professional geologist or professional engineer, indicating the degree to which the water quality data is representative of the injectate fluid or native formation groundwater and provide justification for that conclusion.	▫			▫	
W-IP(1)	Provide a map that shows the location of any pretreatment facilities, location of proposed injection wells and any other injection wells plumbed to the facility.	▫			▫	
W-IP(2)	Provide information including the type of treatment and plan for the disposal of reject water.	▫			▫	
W-IP(3)	Provide representative water quality data of the injectate; collected within the past year. The source of the injectate fluids should be identified including zone/formation and approximate volume percentages. The injection liquid to be analyzed shall be sampled after all additives (if any) are added to the liquid and after all treatment or separation processes (if any), to ensure that it is representative of the liquid actually injected. Sampling protocol for existing projects (project by project) should be provided. Any proposed water sampling and analysis proposed for new or modified projects should follow the most recent Notice to Operators regarding Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-IP(4)	The Aquifer Exemption (AE) conditions as outlined in State Water Board's final concurrence letters need to be addressed in the Operator's application and incorporated into the Project Approval Letters, if appropriate. Such AE conditions may include monitoring that is different than the monitoring requested at the UIC project level. Requested "groundwater monitoring" includes but is not limited to the following: water quality monitoring (e.g. of the injectate and/or groundwater within the newly exempted zone/area), temperature monitoring, and/or pressure monitoring. For those projects with potential conduits into a USDW, a proposed monitoring plan to confirm the pressure front calculations used in determining the change in pressure near problem wells or faults shall be provided.	▫			▫	
W-SI	Using recent (measured within the past 2 years) idle well fluid level data for all idle wells within the AOR, provide a map showing the apparent groundwater flow direction(s) within the injection zone. The supporting data (e.g. acoustic water level surveys) used to create the maps shall be provided.	▫			▫	

Acronyms

AE	Aquifer Exemption
AOR	Area of review
BFW	Base of fresh water
CCR	California Code of Regulations
CP	Cover Page
DF	Data Format
DWR	Department of Water Resources
ES	Engineering Study
GAMA	Groundwater Ambient Monitoring and Assessment Program
GIS	Geographic Information System
GS	Geological Study
IP	Injection Plan
LAS	Log ASCII Standard
OI	Other Standard Information
SI	Situational Information
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
WellSTAR	Well State Tracking and Reporting
ZEI	Zone of Endangering Influence

10/07/2021

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

REQUEST FOR PROJECT DATA DEADLINE EXTENSION FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

On 10/01/2021, CalGEM received a request for an extension to the deadline for updating project data with regard to the UIC project 05403002 . The District Deputy and his technical staff reviewed the request and **approve** the request to extend the deadline of the full data package submission to **11/12/2021**.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion by 11/12/2021. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-1445 or Dale.Peterson@conservation.ca.gov.

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Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

02/25/2022

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- All information indicated in the CalGEM notes column of the attached Project Information Checklist

In order to facilitate a timely review by CalGEM staff, and to best meet regulatory objectives, these materials should be filed with CalGEM through the WellSTAR program whenever possible.

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Pacific Coast Energy Company LP
UIC Project No.: 05403002
09/29/2021

CalGEM requests that the additional data request be submitted by 03/11/2021.

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Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

UNDERGROUND INJECTION CONTROL (UIC)
GEOLOGIC ENERGY MANAGEMENT DIVISION
PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The tables below summarize in checklist form the shared understanding of the Division and the Water Boards regarding the anticipated typical content and format of the project information to be forwarded from the Division to the Water Boards in connection with review of underground injection projects, as described in the Section IV.B. of the Revised Memorandum of Agreement, signed July 2018.

Note that this checklist does not necessarily identify all information an operator must provide to the Division in connection with an approval and ongoing operation of an underground injection project. The requirements for approval and operation of underground injection projects are governed by applicable statutes and regulations. This checklist is not a substitute for those requirements.

Project Category (Project by Project, Periodic Review, New Project, Expansion, Modified Project):
Project Type (Water Disposal, Gas Disposal, Water Flood, Cyclic Steam, Steam Flood):
Number of Wells:
Operator:
Project No.:
Field Name:
Direct Injection Zone(s):
Indirect Migration Injection Zone(s):
DOGGR Reviewing Engineer:
Date Project Submitted:

Unless otherwise indicated, all authority references in the tables below are to sections within California Code of Regulations, title 14.

			Reference Authority	Complete	Location in the Data Package	Operator Notes Supporting / Clarifying Data Presented	Reviewed	CalGEM Notes
Data Format	DF(1)	All data supporting the underground injection project are in a digital format. *The Division and the Water Boards recognize that converting the Division's existing project files to a digital format is an ongoing process. The Division will work with the Water Boards to determine the most appropriate format for the data on a case-by-case basis.*	1724.7(c)	▫			▫	
	DF(2)	All maps, diagrams, and exhibits are clearly and appropriately labeled, such as to title, scale, and purpose, and clearly identify wells, boundaries, zones, contacts, and other relevant data.	1724.7(c)	▫			▫	Maps included without legends. What do different color dots mean? Why are they different sizes? What do different colored lines mean? Why are some dashed? What are thin black lines? Please add appropriate and complete legend.
Cover Page	CP(1)	A cover page including a statement that appropriate licensed professionals, whose signatures and stamps appear at the bottom of the page, are responsible for all data, interpretations, and calculations, if any, subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1. If the operator determines that the submission does not include data, interpretations, or calculations subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1, the cover page must so indicate, and must provide the name(s) and signature(s) of the individual(s) responsible for preparing the submission.	1724.7(d)	▫			▫	Letter only indicates geologic interpretations are certified. Were the quantitative methods and calculations reviewed and certified (engineering portions)? Please provide appropriate statements. See also Water Board cover letter requirements.
	ES(1)	A description of how the area of review was determined, including calculations, variables, citations, and assumptions. *The Division and Water Boards agree the AOR determination should include injection and production impacts of offset projects that could potentially interact with the proposed project, with due consideration for the geology, engineering aspects, and the nature of injected fluids.* *The Division may use the rates, pressures, and volumes included in the calculations as conditions of the Project Approval Letter. For water disposal projects, a determination of the current injectate front and pressure front also may be an important part of the area of review determination.*	1724.7(a)(1)(A)	▫			▫	The model for ZEI must be defined. Assumptions must be provided (no pressure influence, homogeneity of flow, etc.) as well as validating evidence for assumptions. Your model indicates uniform radial flow. Current pressure data provided does not validate this assumption. No citations were provided to justify methodology. Net sand equations are not time dependent. Provide cross validation using permeability and flow calculations. Provide water injection analysis for wells that validate net sand thickness. Why assumed a uniform height cylinder? Validate assumption. Equations are not time or flow dependent. Validate response time/net sand calculations based on permeability. Bernard's equation calculations indicate pressure buildup over time. Not considered in ZEI calculations. ZEI cylinder is already saturated (zone already under pressure). Fluid void not driving fluid movement. Provide quantitative data that demonstrates the pressure buildup calculated has no effect on fate and transport of injectate or fluid movement model based on pressure waves in the reservoir. Section 2.3 "This artificial lift condition creates an inward hydraulic gradient toward each producing wellbore which in turn dictates a preferential flow path toward each injector." Explain the preferential path toward the injector. Transient calculations based on prior operator rock core data from 1967 and 1978+/-. Permeability should be measured based on current conditions. Provide current validation for permeability. Superposition of wells not considered. Operator uses whole field mass balance, but only indicates specific wells as influenced by injection. Calculations are based on injection only, production not considered. Current reservoir pressure data is highly variable. No pressure maps included. Provide justification for your whole field mass balance argument. Provide a pressure map of the field using first formation location in single zone completions. Justify use of average pressure in calculations when measured field pressures are highly variable. Explain how pressure will be monitored and managed.
	ES(2)	A map of the area of review showing the location of the following: (1) All wells within and adjacent to the boundary of the area of review; (2) All water supply wells that are within the area of review and identified in public records or otherwise known to the operator; (3) Any underground disposal horizons, mining, and other subsurface industrial activities not associated with oil and gas production within the area of review, to the extent such information is publicly available or otherwise known to the operator; and (4) Traces of the geologic cross sections provided as part of the Geologic Study. *The historical term 'project area' may be shown as the map view projection of the injection zone defined in 1720.1(g). The 'project area' can include a single area of review (AOR), multiple AORs, or any overlapping cumulative effects of the AORs.*	1724.7(a)(1)(B) 1724.8	▫			▫	No notes regarding other underground activity or lack thereof. Please provide an appropriate statement regarding any subsurface industrial activities. See prior note about map legends.

ES(3)	A compendium of the following information: (1) For all wells depicted in the map of the area of review (including water supply wells to the extent information is known or publicly available), the API numbers, or other identifying information for wells that do not have API numbers, and the wellbore paths, total depths, and depths of completion interval(s) of the wells; (2) The type and status of water supply wells depicted in the map of the area of review; and (3) All the casing diagram data specified in Section 1724.7.1, provided in the form of graphical casing diagrams or flat-file data sets, for all wells that are within the area of review and that are completed in or penetrating the injection zone for the underground injection project or a deeper zone, including directionally drilled wells that intersect the area of review in the injection zone or a deeper zone.	1724.7(a)(1)(C) 1724.7.1 1724.8	▫			▫	Well compendium not provided. Provide compendium of wells including items listed in ES (3) as well as depth of zones, USDW, BFW, top of annular cement in production casing, and tops of injection zones. 37 WBDs are provided (34 from operator and 3 from offset operators). Some diagrams do not include required elements. Provide diagrams with all required elements. No wellbore identified as potential conduit by operator. CalGEM review identified 7 potential conduits for fluid to move outside the approved zone of injection: •WP-26 (037-20926) Open annulus from THZ/TIZ (4274′-1178′) •WP-01 (037-00995) Open hole above TIZ •WP 18 RD2 (037-20434) Open hole above TIZ •HW10 RD1 (037-21994) Annular TOC below TIZ •EBH 1 (037-00994) Repetto marker not included on WBD. OH abandonment above Hauser marker. Operator needs to identify whether Repetto penetrated and depth based on logs. If not penetrating provide log data that validates conclusion. •U50-5 (037-00113) Open hole filled with mud below 1204′. No markers on diagram. •S-2A (037-20666) Repetto marker not included on WBD. No annular cement above 5390′. Operator needs to identify whether Repetto penetrated and depth based on logs. If not penetrating provide log data that validates conclusion. Identify all sand markers and impermeable strata above the zone of injection that would allow/prevent migration of injection fluids. Explain why the identified wells were not identified as conduits for fluid outside the approved zone of injection.

	ES(4)	The planned well-drilling and plugging-and-abandonment program to complete the project, including a flood-pattern map, if applicable, showing all injection, production, and plugged and abandoned wells, and unit boundaries. *The Division recognizes plans are subject to change during the course of a project review. It is the operator's responsibility to update project data accordingly prior to approval.*	1724.7(a)(1)(D) 1724.8	▫			▫	

Geologic Study	GS(1)	Geologic information describing the reservoir characteristics of the injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations. The scope of the geologic characterization shall encompass the caprock and sealing mechanisms, the injection zone including the vertical interval above and below the approved injection zone, and the areas where potential migration of fluid or entrapment of migrated fluid could occur. *The Division and Water Boards agree all supporting data shall be the most current, accurate and relevant. All data sources shall be cited.*	1724.7(a)(2)(A)	▫			▫	What are sources of information for geologic background and interpretation? No citations provided. Please provide citations and justifications for reservoir models, geologic data and characterizations Upper zones (above TIZ) not characterized. Need to characterize upper zones on cross sections and e-logs and provide graphic. Demonstrate that upper zones are not a potential conduit of fluid (from wellbores previously mentioned).
	GS(2)	Reservoir fluid data for the injection zone, such as oil gravity and viscosity, water quality, presence and concentration of non-hydrocarbon components in the associated gas (such as hydrogen sulfide) and specific gravity of gas. Liquid analysis of the reservoir fluid shall be performed in accordance with Section 1724.7.2. *The Division and Water Boards agree supporting documentation for formation fluid TDS determination should be included and from actual samples when available. Supporting documents may include, but are not limited to, historic data, properly documented log derivations, and when available, submission of LAS logs and all constants used for verification.*	1724.7(a)(2)(B) 1724.7.2	▫			▫	Produced fluids sampled Oct 1971-Jan 1972. Reports do not include tests for all required constituents (K, Mn, Sr, Br, temperature, conductance). Sampling protocols not included. Depths and zones sampled? Multiple zone completions? Provide current fluid sampling data for produced zones. Associated gas analysis 11/30/2010. Only results provided. Lab analysis paperwork not included. Unknown methodology on analysis. H2S not included in gas analysis. Do wells produce any H2S? Provide current gas analysis from certified laboratory.
	GS(3)	Structural contour map drawn on a geologic marker at or near the top and base of each injection zone in area of review, indicating faults and any lateral containment features. If faults are identified, there must also be analysis addressing whether or not the faults are capable of confining fluid to the approved injection zone and any geologic features that could result in the migration of fluid out of the approved injection zone. *If a GIS shapefile is submitted, layers with labeled wellbore paths of all existing and proposed wells in the map area would lead to a more comprehensive understanding of the system.*	1724.7(a)(2)(C)	▫			▫	Maps included-same notes regarding map legends
	GS(4)	Isopach map of each injection zone or subzone in the area of review.	1724.7(a)(2)(D)	▫			▫	Operator submitted Isochore maps. May be acceptable. Operator needs to provide required isopach maps or explain why maps are acceptable substitute and why required map not submitted.
	GS(5)	At least two geologic cross sections in the area of review through at least three wells, including one injection well. As near as possible, one of the geologic cross sections shall be along strike and the other shall be perpendicular to strike. The cross section shall extend from the base of the deepest production or injection zone to surface and indicate the location of the approved injection zone, the base of freshwater, and the base of the USDW.	1724.7(a)(2)(E)	▫			▫	N-S section not to surface. Zones above TIZ are not defined on any cross sections. Zones above TIZ need to be defined. Wellbore conduits exist for fluid migration above TIZ, need all sands and pathways above TIZ defined. Provide cross sections that include entire stratigraphy to surface. Cross section Lower Limb E-W shows sharp change in beds. Is this faulting? Explain the structure depicted which crosses multiple zones.
	GS(6)	Representative electric log to a depth below the deepest producing or injection zone, whichever is deeper, identifying all geologic units, formations, USDWs, freshwater aquifers, and oil or gas zones. The electric log shall identify the API number of the well that was logged.	1724.7(a)(2)(F)	▫			▫	Representative logs provided missing zones from 2500'-4600'. Provide representative log from surface to deepest zone that identifies all geologic units.Log for upper zones (0-2500') are from well ¾ mile from drillsite. This well was used to pick USDW and BFW for all wells at drillsite. Well is not part of the project. Can you justify using the well to pick the USDW and BFW at the drillsite? Why was a well from West Pico site not used for this purpose? Provide USDW and BFW picks from logs of wells within the project or use surrounding wells to validate depths. No zonal picks below USDW. Are you indicating there is 4000' of impermeable rock? Justify. Incomplete API on E-log for Sunset Core Hole #1

Injection Plan	IP(1)	A statement of primary purpose of the project.	1724.7(a)(3)(A)	▫			▫	What is the primary purpose of the project? Is it waterflood or water disposal? Your purpose statement indicates both. If waterflood, provide data and analysis demonstrating enhanced recovery.
	IP(2)	A map showing injection facilities related to the project, and piping and instrumentation diagram(s) for the injection facilities.	1724.7(a)(3)(B)	▫			▫	Submitted diagrams are flow charts, not operational blueprint (schematics). Provide facilities map and diagrams that identifies all piping and instrumentation including tanks, vessels, valves, control stations, wells, pumps, and other equipment related to the project.
	IP(3)	A statement of the anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected. *The Division and Water Boards anticipate this data to be based on maximum values.*	1724.7(a)(3)(C)	▫			▫	Cumulative net volume for 5 year project life not provided. Values are imbedded in volumetic ZEI calculation. Values do not match daily volumes anticipated. Provide cumulative volumes and validate calculations using daily volumes. What is your daily production volume? Water cut? Please provide.
	IP(4)	Identification of all wells that are part of the project, including injection wells, affected production wells, water source wells, observation or other wells and any planned wells to the extent known. The depths of water source wells shall also be provided.	1724.7(a)(3)(D)	▫			▫	Wells within AOR included in ZEI calculation section. Compendium of wells as required from ES (2) not provided. Provide compendium of wells.
	IP(5)	Monitoring system, including methods or standard operating procedures to be utilized by the operator to ensure that no damage is occurring and that the injection fluid is confined to the approved injection zone. In the event the Division or the Water Boards require groundwater monitoring in relation to the underground injection project, or as a condition of project approval, the operator shall consult with the State Water Resources Control Board or the Regional Water Quality Control Board and provide the Division with documentation and the results of such consultation.	1724.7(a)(3)(E)	▫			▫	OK
	IP(6)	A description of the method of injection, including such information as injection string configuration and bottom-hole assembly.	1724.7(a)(3)(F)	▫			▫	OK
	IP(7)	A list of the cathodic protection or other corrosion prevention measures employed for plant, lines, and wells, if such measures are warranted.	1724.7(a)(3)(G)	▫			▫	OK
	IP(8)	Identification of the source(s) of the injection fluid and analyses of the injection fluid in accordance with Section 1724.7.2.	1724.7(a)(3)(H) 1724.7.2 *NTO- Guidelines for Collection of Oilfield Water Quality Data*	▫			▫	Samplers log w/ temperature, conductivity and pH not included in report. Provide required samplers log w/ necessary data. Are samples taken after point of makeup water added? One sample is from producer (WP-6) perfed in both zones. What type of tank is #504? Identify sampled tank contents. Injectate sampling should be competed at injection well and injection water tank. Provide analysis of sample of injectate from wellhead. Provide sample from injection water tank, if it is other than tank #504.

Other Standard Information	OI(1)	All data supporting the determination of the maximum allowable surface injection pressure for each injection well in the underground injection project, as described in Section 1724.10.3, including all calculations, variables, citations and assumptions.	1724.7.(a)(4) 1724.10.3	▫			▫	Provide complete data packet from SRTs.
	OI(2)	Copies of letters of notification sent to offset operators by the operator of the underground injection project.	1724.7(a)(5)	▫			▫	OK

Situational Information	SI(1)	Any other data that, in the judgement of the Division, are pertinent and necessary for the proper evaluation of the underground injection project. Examples of such data are: isochore maps, isogor maps, water-oil ratio maps, isobar maps, three-dimensional geologic models, reservoir simulation results, isopach maps of the confining layers, equipment diagrams, and safety programs.	1724.7(a)(6)	▫			▫	Provide pressure map of the reservoir.
	SI(2)	Any alternative data accepted by Division in lieu of the default regulatory requirements for project data, as described in Section 1724.7(e).	1724.7(e)	▫			▫	
	SI(3)	For an underground injection project that includes an injection well with open perforations located within 500 linear feet of the screen or perforations of a water supply well (or a project otherwise required to provide this information as determined by the Division), all of the following information, updated yearly: (1) A water treatment process flow diagram depicting all physical and chemical treatment processes applied to the injection fluid, from its source to the injection well; (2) The safety data sheet for each chemical additive emplaced in injection wells within the underground injection project, and for each chemical added to the fluid to be injected from the time the fluid is first obtained to the time it is injected; (3) The project-aggregate volume or weight of each additive reported; and (4) A brief description of the intended purpose of each additive reported.	1724.10(e)	▫			▫	OK

UNDERGROUND INJECTION CONTROL (UIC)
WATER BOARDS PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The table below summarizes in checklist form the supplemental information required in addition to that listed in the Application checklist that the Water Boards need for review of underground injection projects.

The information requested below is made in lieu of requiring operators to file a report of discharge under California Water Code section 13260 and is consistent with authority provided in Water Code sections 13260, 13267, and 13267.5.

		To help expedite the Water Board's review, please identify the exact WellStar location of the data indicated below.	**Complete**	**Location in the Data Package**	**Operator Notes Supporting / Clarifying Data Presented**	**Reviewed**	**Water Board Notes**
Water Boards	W-CP	For ALL project reviews, the application must include a statement and supporting rationale demonstrating that injected Class II fluids have not (for ongoing projects) and will not (for any project) migrate beyond the boundaries of the exempt aquifer or into a underground source of drinking water (USDW). Any evaluation of past, or anticipated future, migration of injected fluids involving geologic or engineering interpretation must be conducted by, or under the direct supervision of, a state-registered professional geologist or professional engineer and signed and stamped by a registered professional to the extent required by California Business and Professions Code sections 6735, 7835, and 7835.1.	▫			▫	
	W-ES(1)	Provide the rationale for determining the area of review (AOR) with supporting calculations; including the assumptions associated with the calculations. A range of values used to determine average porosity, permeability, and thickness (net and gross) will be provided with the supporting data. The anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected will be provided.	▫			▫	
	W-ES(2)	For all projects, AOR calculations must use an accurate representation of all the relevant parameters from within the project area, including the static pressures or current temperatures of the injection zone(s) and USDW(s) within the AOR. If a range of values for the input parameters is provided, then multiple AORs need to be calculated to provide the most conservative estimate of the distance injected fluids may migrate. This procedure will provide assurance that, if proposed, an AOR of one quarter-mile fixed radius is adequate. The analysis shall consider the heterogeneity of the reservoir. Operator must declare if the formations are homogeneous or heterogeneous. *A ZEI calculation may meet the regulatory requirements of AOR calculation.*	▫			▫	
	W-ES(3)	Provide an evaluation of any potential increase in reservoir pressure and fluid migration due to either overlapping ZEIs, neighboring injection projects, or other relevant inputs into the system (i.e. faults, facies changes and stratigraphic pinchouts that may act as flow barriers). If the change in reservoir pressure due to injections will be reduced by production wells, the Operator will submit calculations that show how the change in reservoir pressure will be offset by the production wells. Injection and production wells used in this evaluation should be identified on the application maps/figures.	▫			▫	
	W-ES(4)	The map of the AOR provided to will also include the following: (1) for all wells; include surface and bottom hole locations and labels that display their well type and status (e.g. active steamflood injector); (2) all faults within the Project Area, and (3) all wells that have been identified as potential conduits to a USDW.	▫			▫	
	W-ES(5)	Well construction diagrams for all wells and boreholes within the AOR need to be provided. Each diagram will identify the depth and perforated interval of the well and borehole, cement plugs, casing damage, key geologic markers (e.g. injection zone), BFW, and USDW. Each well and borehole diagram should depict the entire history (e.g. sidetracks, redrills, and other mechanical changes).	▫			▫	
	W-ES(6)	Provide a water well survey. Water well locations within one mile of the project area shall be presented on a map and listed in an accompanying table. The water well survey should utilize the following data sources (at a minimum): Department of Water Resources (DWR) well completion reports and GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) information system. The following information will be included in the table: location information, type (municipal, domestic, irrigation, industrial, stock), status (active, idle, abandoned, destroyed), owner, well completion depth and zone name, and depths for all screened intervals. On a case-by-case basis, an expanded water well survey may be necessary based upon potential risk to beneficial use water outside the limits of the AOR. For those well completion reports that do not provide the latitude and longitude coordinates, the Operator should attempt to determine its location by a field survey.	▫			▫	
	W-GS(1)	All supporting maps (e.g. structural contour map) need to include the AOR and Project Area, existing exemption boundaries, faults (with displacement information), lines of cross-section, a scale, an explanation describing what the symbols and colors used represent, north arrow, and identify the name of formation or unit mapped. Also, structural contour and isopach maps of the upper and lower "confining" units need to be provided. Representative permeability and porosity values, if available, of the "confining" units should be labeled on these maps. The cross sections need to include the AOR(s), the proposed injection zone, confining units, the formation or units penetrated by injection wells with associated API numbers, water supply wells, locations of the base of fresh water (BFW) and USDW, deviated wells within the line of section (i.e. wells near the cross-section trace), and an explanation describing what colors and symbols mean.	▫			▫	
	W-GS(2)	The type log provided will include labeled geophysical curves and a vertical scale. The method and data used to determine the base of USDW should be included in the application.	▫			▫	

W-GS(3)	Provide representative water quality data (collected within the past 5 years) of the injection zone from well(s) located within the AOR. The injection zone groundwater analysis should be representative of the reservoir groundwater in its native condition. The groundwater analyzed shall be either sampled from the injection zone itself prior to commencement of any injection into the reservoir or sampled from an analogous reservoir that has not already received injection fluid. The representative sample shall be recovered after all completion and drilling fluid has been circulated from the wellbore. Any proposed groundwater sampling and analysis proposed for new or modified projects must follow the most recent version of the Notice to Operators – Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-GS(4)	If the injection zone is not an exempted aquifer, then a non-USDW determination shall be made using recent (collected within the past 5 years) water quality samples of the injection zone groundwater within the Project Area. If no wells exist within the Project Area, then total dissolved solids (TDS) well log calculations can be used provided that: 1) The accuracy (i.e. percent error) of the computed result is validated with a water quality sample of the same injection zone groundwater within 1 mile of the project area; and 2) The method, calculations, and assumptions used in the TDS analysis are provided. If the Operator determines through water quality sampling or TDS calculations that the injection zone and/or overlying formations are non-USDWs, the lateral and vertical extent of this determination shall be defined on the application maps and cross sections.	▫			▫	
W-GS(5)	Any groundwater quality data or well log analysis that will be used to justify the injection of fluids (e.g., showing that TDS concentrations within the proposed injection zone are greater than 10,000 milligrams per liter) must be accompanied by a written statement or report, prepared by a state-registered professional geologist or professional engineer, indicating the degree to which the water quality data is representative of the injectate fluid or native formation groundwater and provide justification for that conclusion.	▫			▫	
W-IP(1)	Provide a map that shows the location of any pretreatment facilities, location of proposed injection wells and any other injection wells plumbed to the facility.	▫			▫	
W-IP(2)	Provide information including the type of treatment and plan for the disposal of reject water.	▫			▫	
W-IP(3)	Provide representative water quality data of the injectate; collected within the past year. The source of the injectate fluids should be identified including zone/formation and approximate volume percentages. The injection liquid to be analyzed shall be sampled after all additives (if any) are added to the liquid and after all treatment or separation processes (if any), to ensure that it is representative of the liquid actually injected. Sampling protocol for existing projects (project by project) should be provided. Any proposed water sampling and analysis proposed for new or modified projects should follow the most recent Notice to Operators regarding Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-IP(4)	The Aquifer Exemption (AE) conditions as outlined in State Water Board's final concurrence letters need to be addressed in the Operator's application and incorporated into the Project Approval Letters, if appropriate. Such AE conditions may include monitoring that is different than the monitoring requested at the UIC project level. Requested "groundwater monitoring" includes but is not limited to the following: water quality monitoring (e.g. of the injectate and/or groundwater within the newly exempted zone/area), temperature monitoring, and/or pressure monitoring. For those projects with potential conduits into a USDW, a proposed monitoring plan to confirm the pressure front calculations used in determining the change in pressure near problem wells or faults shall be provided.	▫			▫	
W-SI	Using recent (measured within the past 2 years) idle well fluid level data for all idle wells within the AOR, provide a map showing the apparent groundwater flow direction(s) within the injection zone. The supporting data (e.g. acoustic water level surveys) used to create the maps shall be provided.	▫			▫	

Acronyms

AE	Aquifer Exemption
AOR	Area of review
BFW	Base of fresh water
CCR	California Code of Regulations
CP	Cover Page
DF	Data Format
DWR	Department of Water Resources
ES	Engineering Study
GAMA	Groundwater Ambient Monitoring and Assessment Program
GIS	Geographic Information System
GS	Geological Study
IP	Injection Plan
LAS	Log ASCII Standard
OI	Other Standard Information
SI	Situational Information
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
WellSTAR	Well State Tracking and Reporting
ZEI	Zone of Endangering Influence

03/10/2022

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

REQUEST FOR PROJECT DATA DEADLINE EXTENSION FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

On 03/04/2022, CalGEM received a request for an extension to the deadline for updating project data with regard to the UIC project 05403002. The District Deputy and his technical staff reviewed the request and **approve** the request to extend the deadline of the full data package submission to **04/15/2022**.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion by 04/15/2022. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

Phillip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
03/10/2022

If you have any questions or concerns regarding this request, please contact Dale Peterson at (562) 637-1445 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Baldev Gill

Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

05/26/2022

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

REQUEST FOR PROJECT DATA DEADLINE EXTENSION FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

On 05/18/2022, CalGEM received a request for an extension to the deadline for updating project data with regard to the UIC project 05403002. The District Deputy and his technical staff reviewed the request and **approve** the request to extend the deadline of the full data package submission to **06/10/2022**.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion by 06/10/2022. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

Phillip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
05/26/2022

If you have any questions or concerns regarding this request, please contact Dale Peterson at (562) 637-1445 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Baldev Gill

Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

06/23/2022

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

FOLLOWUP REQUEST FOR ADDITIONAL PROJECT DATA FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

After an initial review of your updated submission package, CalGEM requires additional data to support your application for project approval. These data are necessary for CalGEM's ongoing evaluation of the project's continued safe operation in compliance with current standard requirements and any pertinent project-specific conditions. For that reason, these same regulations require that the operator ensure these supporting data remain updated for accuracy and completeness throughout the operational life of the project. (Cal. Code Regs., tit. 14, § 1724.7.) Additional data needed for this project review include as follows:

- All information indicated in the CalGEM notes column of the attached Project Information Checklist

In order to facilitate a timely review by CalGEM staff, and to best meet regulatory objectives, these materials should be filed with CalGEM through the WellSTAR program whenever possible.

Philip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
06/23/2022

CalGEM requests that the additional data request be submitted by 07/07/2022.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-4400 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Dale Peterson
Engineering Geologist
Geologic Energy Management Division (Southern District)

cc: Project File

UNDERGROUND INJECTION CONTROL (UIC)
GEOLOGIC ENERGY MANAGEMENT DIVISION
PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The tables below summarize in checklist form the shared understanding of the Division and the Water Boards regarding the anticipated typical content and format of the project information to be forwarded from the Division to the Water Boards in connection with review of underground injection projects, as described in the Section IV.B. of the Revised Memorandum of Agreement, signed July 2018.

Note that this checklist does not necessarily identify all information an operator must provide to the Division in connection with an approval and ongoing operation of an underground injection project. The requirements for approval and operation of underground injection projects are governed by applicable statutes and regulations. This checklist is not a substitute for those requirements.

Project Category (Project by Project, Periodic Review, New Project, Expansion, Modified Project)**: Project by Project**
Project Type (Water Disposal, Gas Disposal, Water Flood, Cyclic Steam, Steam Flood)**: Waterflood**
Number of Wells: 62
Operator: Pacific Coast Energy Co.
Project No.: 05403002
Field Name: Beverly Hills
Direct Injection Zone(s): Repetto and Hauser
Indirect Migration Injection Zone(s): N/A
DOGGR Reviewing Engineer: Dale Peterson
Date Project Submitted: 06/10/2022

Unless otherwise indicated, all authority references in the tables below are to sections within California Code of Regulations, title 14.

			Reference Authority	Complete	Location in the Data Package	Operator Notes Supporting / Clarifying Data Presented	Reviewed	CalGEM Notes
Data Format	DF(1)	All data supporting the underground injection project are in a digital format. *The Division and the Water Boards recognize that converting the Division's existing project files to a digital format is an ongoing process. The Division will work with the Water Boards to determine the most appropriate format for the data on a case-by-case basis.*	1724.7(c)	▫			▫	OK
	DF(2)	All maps, diagrams, and exhibits are clearly and appropriately labeled, such as to title, scale, and purpose, and clearly identify wells, boundaries, zones, contacts, and other relevant data.	1724.7(c)	▫			▫	OK
Cover Page	CP(1)	A cover page including a statement that appropriate licensed professionals, whose signatures and stamps appear at the bottom of the page, are responsible for all data, interpretations, and calculations, if any, subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1. If the operator determines that the submission does not include data, interpretations, or calculations subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1, the cover page must so indicate, and must provide the name(s) and signature(s) of the individual(s) responsible for preparing the submission.	1724.7(d)	▫			▫	Letter Does not include statement that the engineering portion of the submission is outside the Business and Professions code. If engineering submission includes items subject to these requirements, it must be stamped by appropriate licensed individuals otherwise a statement is required that submission is outside the B & P codes.
Engineering Study	ES(1)	A description of how the area of review was determined, including calculations, variables, citations, and assumptions. *The Division and Water Boards agree the AOR determination should include injection and production impacts of offset projects that could potentially interact with the proposed project, with due consideration for the geology, engineering aspects, and the nature of injected fluids.* *The Division may use the rates, pressures, and volumes included in the calculations as conditions of the Project Approval Letter. For water disposal projects, a determination of the current injectate front and pressure front also may be an important part of the area of review determination.*	1724.7(a)(1)(A)	▫			▫	OK
	ES(2)	A map of the area of review showing the location of the following: (1) All wells within and adjacent to the boundary of the area of review; (2) All water supply wells that are within the area of review and identified in public records or otherwise known to the operator; (3) Any underground disposal horizons, mining, and other subsurface industrial activities not associated with oil and gas production within the area of review, to the extent such information is publicly available or otherwise known to the operator; and (4) Traces of the geologic cross sections provided as part of the Geologic Study. *The historical term 'project area' may be shown as the map view projection of the injection zone defined in 1720.1(g). The 'project area' can include a single area of review (AOR), multiple AORs, or any overlapping cumulative effects of the AORs.*	1724.7(a)(1)(B) 1724.8	▫			▫	OK
	ES(3)	A compendium of the following information: (1) For all wells depicted in the map of the area of review (including water supply wells to the extent information is known or publicly available), the API numbers, or other identifying information for wells that do not have API numbers, and the wellbore paths, total depths, and depths of completion interval(s) of the wells; (2) The type and status of water supply wells depicted in the map of the area of review; and (3) All the casing diagram data specified in Section 1724.7.1, provided in the form of graphical casing diagrams or flat-file data sets, for all wells that are within the area of review and that are completed in or penetrating the injection zone for the underground injection project or a deeper zone, including directionally drilled wells that intersect the area of review in the injection zone or a deeper zone.	1724.7(a)(1)(C) 1724.7.1 1724.8	▫			▫	Well P19A, P49A and S41 (other operators) are not included in well compendium. Provide compendium with all 62 wells submitted for project. Missing well bore diagrams for, OW08 OH, OW08 RD1, RW2-OH, WP 02, WP20 RD1, WP20 RD2 and WP34 OH. Provide diagrams. WP21 RD3 mislabeled as RD4 Correct and provide WBDs for well. WP45 and WP20 should be labeled with OH. Correct and provide WBDs for wells 4 diagrams are missing the marker for the top of the Repetto (TIZ). WP58, WP12 OH, WP34 RD1 and WP39 OH. Correct and provide WBDs for wells. USDW and BFW missing from WP32 and S-41. Correct and provide WBDs for wells.

	ES(4)	The planned well-drilling and plugging-and-abandonment program to complete the project, including a flood-pattern map, if applicable, showing all injection, production, and plugged and abandoned wells, and unit boundaries. *The Division recognizes plans are subject to change during the course of a project review. It is the operator's responsibility to update project data accordingly prior to approval.*	1724.7(a)(1)(D) 1724.8	▫			▫	OK

Geologic Study	GS(1)	Geologic information describing the reservoir characteristics of the injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations. The scope of the geologic characterization shall encompass the caprock and sealing mechanisms, the injection zone including the vertical interval above and below the approved injection zone, and the areas where potential migration of fluid or entrapment of migrated fluid could occur. *The Division and Water Boards agree all supporting data shall be the most current, accurate and relevant. All data sources shall be cited.*	1724.7(a)(2)(A)	▫			▫	OK
	GS(2)	Reservoir fluid data for the injection zone, such as oil gravity and viscosity, water quality, presence and concentration of non-hydrocarbon components in the associated gas (such as hydrogen sulfide) and specific gravity of gas. Liquid analysis of the reservoir fluid shall be performed in accordance with Section 1724.7.2. *The Division and Water Boards agree supporting documentation for formation fluid TDS determination should be included and from actual samples when available. Supporting documents may include, but are not limited to, historic data, properly documented log derivations, and when available, submission of LAS logs and all constants used for verification.*	1724.7(a)(2)(B) 1724.7.2	▫			▫	Fluids sample for Repetto are from Oct 1971-Jan 1972. Reports do not include tests for all required constituents (K, Mn, Sr, Br, temperature, conductance). Sampling protocols not included. Need zone specific fluid sample that comply with 1724.7.2. Provide. Oil gravity and viscosity report for Repetto formation. Provide sample report from Repetto only completion.
	GS(3)	Structural contour map drawn on a geologic marker at or near the top and base of each injection zone in area of review, indicating faults and any lateral containment features. If faults are identified, there must also be analysis addressing whether or not the faults are capable of confining fluid to the approved injection zone and any geologic features that could result in the migration of fluid out of the approved injection zone. *If a GIS shapefile is submitted, layers with labeled wellbore paths of all existing and proposed wells in the map area would lead to a more comprehensive understanding of the system.*	1724.7(a)(2)(C)	▫			▫	Require structure map for base of both injection zones. Provide.
	GS(4)	Isopach map of each injection zone or subzone in the area of review.	1724.7(a)(2)(D)	▫			▫	OK
	GS(5)	At least two geologic cross sections in the area of review through at least three wells, including one injection well. As near as possible, one of the geologic cross sections shall be along strike and the other shall be perpendicular to strike. The cross section shall extend from the base of the deepest production or injection zone to surface and indicate the location of the approved injection zone, the base of freshwater, and the base of the USDW.	1724.7(a)(2)(E)	▫			▫	Full approved injection zone not indicated on cross sections (only current injection intervals). Add Repetto zone as injection zone on map (as per PAL).
	GS(6)	Representative electric log to a depth below the deepest producing or injection zone, whichever is deeper, identifying all geologic units, formations, USDWs, freshwater aquifers, and oil or gas zones. The electric log shall identify the API number of the well that was logged.	1724.7(a)(2)(F)	▫			▫	OK

Injection Plan	IP(1)	A statement of primary purpose of the project.	1724.7(a)(3)(A)	▫			▫	OK
	IP(2)	A map showing injection facilities related to the project, and piping and instrumentation diagram(s) for the injection facilities.	1724.7(a)(3)(B)	▫			▫	OK
	IP(3)	A statement of the anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected. *The Division and Water Boards anticipate this data to be based on maximum values.*	1724.7(a)(3)(C)	▫			▫	OK
	IP(4)	Identification of all wells that are part of the project, including injection wells, affected production wells, water source wells, observation or other wells and any planned wells to the extent known. The depths of water source wells shall also be provided.	1724.7(a)(3)(D)	▫			▫	OK
	IP(5)	Monitoring system, including methods or standard operating procedures to be utilized by the operator to ensure that no damage is occurring and that the injection fluid is confined to the approved injection zone. In the event the Division or the Water Boards require groundwater monitoring in relation to the underground injection project, or as a condition of project approval, the operator shall consult with the State Water Resources Control Board or the Regional Water Quality Control Board and provide the Division with documentation and the results of such consultation.	1724.7(a)(3)(E)	▫			▫	OK
	IP(6)	A description of the method of injection, including such information as injection string configuration and bottom-hole assembly.	1724.7(a)(3)(F)	▫			▫	OK
	IP(7)	A list of the cathodic protection or other corrosion prevention measures employed for plant, lines, and wells, if such measures are warranted.	1724.7(a)(3)(G)	▫			▫	OK
	IP(8)	Identification of the source(s) of the injection fluid and analyses of the injection fluid in accordance with Section 1724.7.2.	1724.7(a)(3)(H) 1724.7.2 *NTO- Guidelines for Collection of Oilfield Water Quality Data*	▫			▫	OK

Other Standard Information	OI(1)	All data supporting the determination of the maximum allowable surface injection pressure for each injection well in the underground injection project, as described in Section 1724.10.3, including all calculations, variables, citations and assumptions.	1724.7.(a)(4) 1724.10.3	▫			▫	OK
	OI(2)	Copies of letters of notification sent to offset operators by the operator of the underground injection project.	1724.7(a)(5)	▫			▫	OK

Situational Information	SI(1)	Any other data that, in the judgement of the Division, are pertinent and necessary for the proper evaluation of the underground injection project. Examples of such data are: isochore maps, isogor maps, water-oil ratio maps, isobar maps, three-dimensional geologic models, reservoir simulation results, isopach maps of the confining layers, equipment diagrams, and safety programs.	1724.7(a)(6)	▫			▫	OK
	SI(2)	Any alternative data accepted by Division in lieu of the default regulatory requirements for project data, as described in Section 1724.7(e).	1724.7(e)	▫			▫	OK
	SI(3)	For an underground injection project that includes an injection well with open perforations located within 500 linear feet of the screen or perforations of a water supply well (or a project otherwise required to provide this information as determined by the Division), all of the following information, updated yearly: (1) A water treatment process flow diagram depicting all physical and chemical treatment processes applied to the injection fluid, from its source to the injection well; (2) The safety data sheet for each chemical additive emplaced in injection wells within the underground injection project, and for each chemical added to the fluid to be injected from the time the fluid is first obtained to the time it is injected; (3) The project-aggregate volume or weight of each additive reported; and (4) A brief description of the intended purpose of each additive reported.	1724.10(e)	▫			▫	OK

UNDERGROUND INJECTION CONTROL (UIC)
WATER BOARDS PROJECT INFORMATION CHECKLIST
The purpose of this document is to streamline CalGEM and Water Boards review
(APRIL 8, 2020 VERSION)

The table below summarizes in checklist form the supplemental information required in addition to that listed in the Application checklist that the Water Boards need for review of underground injection projects.

The information requested below is made in lieu of requiring operators to file a report of discharge under California Water Code section 13260 and is consistent with authority provided in Water Code sections 13260, 13267, and 13267.5.

		To help expedite the Water Board's review, please identify the exact WellStar location of the data indicated below.	**Complete**	**Location in the Data Package**	**Operator Notes Supporting / Clarifying Data Presented**	**Reviewed**	**Water Board Notes**
Water Boards	W-CP	For ALL project reviews, the application must include a statement and supporting rationale demonstrating that injected Class II fluids have not (for ongoing projects) and will not (for any project) migrate beyond the boundaries of the exempt aquifer or into a underground source of drinking water (USDW). Any evaluation of past, or anticipated future, migration of injected fluids involving geologic or engineering interpretation must be conducted by, or under the direct supervision of, a state-registered professional geologist or professional engineer and signed and stamped by a registered professional to the extent required by California Business and Professions Code sections 6735, 7835, and 7835.1.	▫			▫	
	W-ES(1)	Provide the rationale for determining the area of review (AOR) with supporting calculations; including the assumptions associated with the calculations. A range of values used to determine average porosity, permeability, and thickness (net and gross) will be provided with the supporting data. The anticipated project duration, anticipated daily rate of injection (by well), and anticipated cumulative net volume of fluid to be injected will be provided.	▫			▫	
	W-ES(2)	For all projects, AOR calculations must use an accurate representation of all the relevant parameters from within the project area, including the static pressures or current temperatures of the injection zone(s) and USDW(s) within the AOR. If a range of values for the input parameters is provided, then multiple AORs need to be calculated to provide the most conservative estimate of the distance injected fluids may migrate. This procedure will provide assurance that, if proposed, an AOR of one quarter-mile fixed radius is adequate. The analysis shall consider the heterogeneity of the reservoir. Operator must declare if the formations are homogeneous or heterogeneous. *A ZEI calculation may meet the regulatory requirements of AOR calculation.*	▫			▫	
	W-ES(3)	Provide an evaluation of any potential increase in reservoir pressure and fluid migration due to either overlapping ZEIs, neighboring injection projects, or other relevant inputs into the system (i.e. faults, facies changes and stratigraphic pinchouts that may act as flow barriers). If the change in reservoir pressure due to injections will be reduced by production wells, the Operator will submit calculations that show how the change in reservoir pressure will be offset by the production wells. Injection and production wells used in this evaluation should be identified on the application maps/figures.	▫			▫	
	W-ES(4)	The map of the AOR provided to will also include the following: (1) for all wells; include surface and bottom hole locations and labels that display their well type and status (e.g. active steamflood injector); (2) all faults within the Project Area, and (3) all wells that have been identified as potential conduits to a USDW.	▫			▫	
	W-ES(5)	Well construction diagrams for all wells and boreholes within the AOR need to be provided. Each diagram will identify the depth and perforated interval of the well and borehole, cement plugs, casing damage, key geologic markers (e.g. injection zone), BFW, and USDW. Each well and borehole diagram should depict the entire history (e.g. sidetracks, redrills, and other mechanical changes).	▫			▫	
	W-ES(6)	Provide a water well survey. Water well locations within one mile of the project area shall be presented on a map and listed in an accompanying table. The water well survey should utilize the following data sources (at a minimum): Department of Water Resources (DWR) well completion reports and GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) information system. The following information will be included in the table: location information, type (municipal, domestic, irrigation, industrial, stock), status (active, idle, abandoned, destroyed), owner, well completion depth and zone name, and depths for all screened intervals. On a case-by-case basis, an expanded water well survey may be necessary based upon potential risk to beneficial use water outside the limits of the AOR. For those well completion reports that do not provide the latitude and longitude coordinates, the Operator should attempt to determine its location by a field survey.	▫			▫	
	W-GS(1)	All supporting maps (e.g. structural contour map) need to include the AOR and Project Area, existing exemption boundaries, faults (with displacement information), lines of cross-section, a scale, an explanation describing what the symbols and colors used represent, north arrow, and identify the name of formation or unit mapped. Also, structural contour and isopach maps of the upper and lower "confining" units need to be provided. Representative permeability and porosity values, if available, of the "confining" units should be labeled on these maps. The cross sections need to include the AOR(s), the proposed injection zone, confining units, the formation or units penetrated by injection wells with associated API numbers, water supply wells, locations of the base of fresh water (BFW) and USDW, deviated wells within the line of section (i.e. wells near the cross-section trace), and an explanation describing what colors and symbols mean.	▫			▫	
	W-GS(2)	The type log provided will include labeled geophysical curves and a vertical scale. The method and data used to determine the base of USDW should be included in the application.	▫			▫	

W-GS(3)	Provide representative water quality data (collected within the past 5 years) of the injection zone from well(s) located within the AOR. The injection zone groundwater analysis should be representative of the reservoir groundwater in its native condition. The groundwater analyzed shall be either sampled from the injection zone itself prior to commencement of any injection into the reservoir or sampled from an analogous reservoir that has not already received injection fluid. The representative sample shall be recovered after all completion and drilling fluid has been circulated from the wellbore. Any proposed groundwater sampling and analysis proposed for new or modified projects must follow the most recent version of the Notice to Operators – Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-GS(4)	If the injection zone is not an exempted aquifer, then a non-USDW determination shall be made using recent (collected within the past 5 years) water quality samples of the injection zone groundwater within the Project Area. If no wells exist within the Project Area, then total dissolved solids (TDS) well log calculations can be used provided that: 1) The accuracy (i.e. percent error) of the computed result is validated with a water quality sample of the same injection zone groundwater within 1 mile of the project area; and 2) The method, calculations, and assumptions used in the TDS analysis are provided. If the Operator determines through water quality sampling or TDS calculations that the injection zone and/or overlying formations are non-USDWs, the lateral and vertical extent of this determination shall be defined on the application maps and cross sections.	▫			▫	
W-GS(5)	Any groundwater quality data or well log analysis that will be used to justify the injection of fluids (e.g., showing that TDS concentrations within the proposed injection zone are greater than 10,000 milligrams per liter) must be accompanied by a written statement or report, prepared by a state-registered professional geologist or professional engineer, indicating the degree to which the water quality data is representative of the injectate fluid or native formation groundwater and provide justification for that conclusion.	▫			▫	
W-IP(1)	Provide a map that shows the location of any pretreatment facilities, location of proposed injection wells and any other injection wells plumbed to the facility.	▫			▫	
W-IP(2)	Provide information including the type of treatment and plan for the disposal of reject water.	▫			▫	
W-IP(3)	Provide representative water quality data of the injectate; collected within the past year. The source of the injectate fluids should be identified including zone/formation and approximate volume percentages. The injection liquid to be analyzed shall be sampled after all additives (if any) are added to the liquid and after all treatment or separation processes (if any), to ensure that it is representative of the liquid actually injected. Sampling protocol for existing projects (project by project) should be provided. Any proposed water sampling and analysis proposed for new or modified projects should follow the most recent Notice to Operators regarding Guidelines for Collection of Oilfield Water Quality Data.	▫			▫	
W-IP(4)	The Aquifer Exemption (AE) conditions as outlined in State Water Board's final concurrence letters need to be addressed in the Operator's application and incorporated into the Project Approval Letters, if appropriate. Such AE conditions may include monitoring that is different than the monitoring requested at the UIC project level. Requested "groundwater monitoring" includes but is not limited to the following: water quality monitoring (e.g. of the injectate and/or groundwater within the newly exempted zone/area), temperature monitoring, and/or pressure monitoring. For those projects with potential conduits into a USDW, a proposed monitoring plan to confirm the pressure front calculations used in determining the change in pressure near problem wells or faults shall be provided.	▫			▫	
W-SI	Using recent (measured within the past 2 years) idle well fluid level data for all idle wells within the AOR, provide a map showing the apparent groundwater flow direction(s) within the injection zone. The supporting data (e.g. acoustic water level surveys) used to create the maps shall be provided.	▫			▫	

Acronyms

AE	Aquifer Exemption
AOR	Area of review
BFW	Base of fresh water
CCR	California Code of Regulations
CP	Cover Page
DF	Data Format
DWR	Department of Water Resources
ES	Engineering Study
GAMA	Groundwater Ambient Monitoring and Assessment Program
GIS	Geographic Information System
GS	Geological Study
IP	Injection Plan
LAS	Log ASCII Standard
OI	Other Standard Information
SI	Situational Information
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
WellSTAR	Well State Tracking and Reporting
ZEI	Zone of Endangering Influence

09/28/2022

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

REQUEST FOR PROJECT DATA DEADLINE EXTENSION FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

On 09/21/2022, CalGEM received a request for an extension to the deadline for updating project data with regard to the UIC project 05403002. The District Deputy and his technical staff reviewed the request and **approve** the request to extend the deadline of the full data package submission to **10/31/2022**.

This extension was approved to accommodate PCEC's commitment to the Northern District diatomite project.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion by 10/31/2022. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

Phillip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
09/28/2022

If you have any questions or concerns regarding this request, please contact Dale Peterson at (562) 637-4400 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Baldev Gill

Baldev Gill
Southern District Deputy
Geologic Energy Management Division (Southern District)

cc: Project File

PROJECT DATA FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

ADDITIONAL PROJECT DATA REQUIRED

1. Figures 2-31 to 2-33 provided the Interference Analysis Summaries for injectors WP30, WP26 & RW2RD1. Provide all your analytic data and results showing and describing establishment of interference between well pairings. Trend plots of parameters observed should also be provided in the package. This should be included as an appendix. You should also include the data and results used in your simulation models since they are used to validate the methodology.
2. Idle and P&A'd wells within and just outside of 10-year ZEI were identified. Describe how interference was established or not established for these wells? Provide a description of interference establishment between injectors and idle/P&A wells. If interference was not able to be established in wells along the margins (P&A too long ago, etc.) you will need to list those wells and state why.
3. P&A'd wellbores (WP21RD1, WP21, WP21RD2 & RW2 on Figures 2-28 and 2-29) southeast of WP26 and south of RW2RD1, appear to be in close proximity but were not included in the 10-year ZEI. CalGEM's conventional radial-flow, volumetric method of establishing AOR would potentially capture these wells within the radii of influence. Provide the following supporting information to resolve these uncertainties:
    a. Construct and provide an AOR map. Fig 2-30 on page 19 and other similar figures showing 10-year ZEI cannot be considered an AOR map. They simply identify injector-producer interference. AOR maps must include and comply to items described in ES(2) and (3) of the checklist previously provided. Since the wells are directional, the map needs to include wellbore tracks and indicate the completion intervals. If any wells where interference could not be established (such as old P&A wells) are within 400 ft of the completion zone of the injector, a WBD must be submitted and it needs to be added to the well compendium.
    b. Welltracks and sidetracks of deviated wells should be displayed on the AOR map.
4. WP30 is open to both DM sands and Hauser. Please clarify and confirm if 0.64 psi/ft frac gradient established by the SRT is for Hauser only or for combined Hauser and DM sands (note that CalGEM Datasheets indicate that DM sands have higher permeability of 107 md compared to 77 md for Hauser). It is highly recommended to compare injection rates during SRT with those of injection surveys to check on possible opening of DM sands at relatively higher rates during testing. Explain and support your conclusions.
5. The SRT plot for WP 26 indicates a breakoff pressure of ~3240 psi, but the tabulated results show 4,000 psi. Please clarify/verify.
6. Geology Nomenclature in document: There is no Dunsmuir, Hauser or Ogden "Formation." These units are zones or "sands" in the Modelo Formation. The nomenclature needs to be corrected within the document.

7. Isopach Maps
    a. The **top of zone well locations, ID's and contoured thickness values** should be plotted and **clearly labeled** on the maps or data should be provided in a table such as this:

API	Well Designation	Intersection Latitude	Intersection Longitude	Intersection Depth (SubSea feet)

8. Structural Contour Maps
    a. Base of Repetto Structural Contour Map is missing.
    b. Base of Hauser Structural Contour Map is missing
    c. The **top of zone well locations, ID's and contoured values** should be plotted and **clearly labeled** on the maps or data should be provided in a table such as this:

API	Well Designation	Intersection Latitude	Intersection Longitude	Intersection Depth (SubSea feet)

11/18/2022

VIA EMAIL ONLY

Philip Brown
Pacific Coast Energy Company LP
1555 Orcutt Hill Road, Orcutt, CA 93455
Philip.Brown@PCECLP.com

Dear Mr. Brown:

FOLLOWUP REQUEST FOR ADDITIONAL PROJECT DATA FOR UNDERGROUND INJECTION PROJECT NUMBER 05403002, REPETTO AND HAUSER (MIOCENE) ZONES, BEVERLY HILLS, WATERFLOOD

After an initial review of your updated submission package, CalGEM requires additional data to support your application for project approval. These data are necessary for CalGEM's ongoing evaluation of the project's continued safe operation in compliance with current standard requirements and any pertinent project-specific conditions. For that reason, these same regulations require that the operator ensure these supporting data remain updated for accuracy and completeness throughout the operational life of the project. (Cal. Code Regs., tit. 14, § 1724.7.) Additional data needed for this project review include as follows:

- An AOR map that complies to items described in ES(2) and (3) of the checklist previously provided. Specifically, the revised map must include a map scale and traces of the cross sections previously submitted. The map should also include any water supply wells plotted within the area of review. The map should be completed as a separate pdf (not an embedded figure) and submitted as an appendix. A revised table of contents will also need to be submitted that includes the additional appendix.

In order to facilitate a timely review by CalGEM staff, and to best meet regulatory objectives, these materials should be filed with CalGEM through the WellSTAR program whenever possible.

Philip Brown
Pacific Coast Energy Company LP
UIC Project No.: 05403002
11/18/2022

CalGEM requests that the additional data request be submitted by 11/28/2022.

Updating the supporting data for this project is an important matter of regulatory compliance. Accordingly, CalGEM anticipates and expects you will prioritize its expeditious completion. Any injection project not supported by complete and accurate data sufficient to demonstrate compliance with all applicable requirements may be subject to modification, suspension, or rescission by CalGEM. (Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7.) Additionally, failure to comply with applicable requirements for operation of an injection project may result in the imposition of civil penalties or other enforcement action. (Pub. Resources Code, §§ 3236.5, 3237.)

If you have any questions or concerns regarding this request, please contact Dale Peterson at 562-637-4400 or Dale.Peterson@conservation.ca.gov.

Sincerely,

Dale Peterson

Dale Peterson
Associate Oil and Gas Engineer
Geologic Energy Management Division (Southern District)

cc: Project File

From:	UICMOA@DOC
To:	WB-DWQ-UICProject
Cc:	Zinky, Janice@Waterboards; Bauer, Tina@Waterboards; Garg, Amit@DOC; Beskas, Pete@DOC; Ghosh, Suman@DOC; Gill, Baldev@DOC; Wang, Wenli@DOC
Subject:	FW: UIC Project Modification Review. 05403002, in the Beverly Hills Field, in Los Angeles County, for Pacific Coast Energy Company LP, with Modification Reason Project by Project Review.
Date:	Wednesday, December 14, 2022 4:12:40 PM
Importance:	High

EXTERNAL:

Raymundo G Orizonte
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California Geologic Energy Management
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-----Original Message-----
From: NoReply@conservation.ca.gov <NoReply@conservation.ca.gov>
Sent: Wednesday, December 14, 2022 4:11 PM
To: UICMOA@DOC <UICMOA@conservation.ca.gov>
Subject: UIC Project Modification Review. 05403002, in the Beverly Hills Field, in Los Angeles County, for Pacific Coast Energy Company LP, with Modification Reason Project by Project Review.
Importance: High

An Application for Injection Approval to modify Project 05403002, in the Beverly Hills Field, in Los Angeles County, has been submitted for Pacific Coast Energy Company LP. Please review the application in WellSTAR and communicate with the Southern District UIC group regarding the results.
Application Form ID: 253372