

State of Colorado  
Energy & Carbon Management Commission

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Document Number:  
404234574

Receive Date:

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Report taken by:

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by ECMC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27.

This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

Name of Operator: <u>PDC ENERGY INC</u>	Operator No: <u>69175</u>	<b>Phone Numbers</b>
Address: <u>1099 18TH STREET SUITE 1500</u>		Phone: <u>(832) 349-0757</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80202</u>		Mobile: <u>( )</u>
Contact Person: <u>Lauren Hoff</u>	Email: <u>lauren.hoff@chevron.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 23602 Initial Form 27 Document #: 403065592

PURPOSE INFORMATION

- Rule 913.c.(1): Pit or Cuttings Trench closure.
- Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- Rule 913.g: Changes of Operator.
- Rule 915.b: Request to leave elevated inorganics in situ.
- Other: \_\_\_\_\_

SITE INFORMATION

Yes  Multiple Facilities

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-20240</u>	County Name: <u>WELD</u>
Facility Name: <u>HOWARD 14-18</u>	Latitude: <u>40.393500</u>	Longitude: <u>-104.600110</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSW</u>	Sec: <u>18</u>	Twp: <u>5N</u>	Range: <u>64W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>331157</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HOWARD-65N64W 18SWSW</u>	Latitude: <u>40.393535</u>	Longitude: <u>-104.600136</u>	
** correct Lat/Long if needed: Latitude: <u>40.393492</u>		Longitude: <u>-104.600577</u>	
QtrQtr: <u>SWSW</u>	Sec: <u>18</u>	Twp: <u>5N</u>	Range: <u>64W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

## SITE CONDITIONS

General soil type - USCS Classifications SP

Most Sensitive Adjacent Land Use Agricultural

Is domestic water well within 1/4 mile? Yes

Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? Yes

### Other Potential Receptors within 1/4 mile

Tank Battery: Irrigation - 390' SSW; Surface Water: Irrigation Ditch - 85' SSE; Occupied Building: 180' SSE; Livestock: 390' S; FWS Wetlands: 820' NNW Freshwater Pond (PUBFx).

Wellhead (Howard 14-18): Irrigation - 490' SW; Surface Water: Irrigation Ditch - 35' SSE; Occupied Building: 185' SSW; Livestock: 420' SSW; FWS Wetlands: 892' NW Freshwater Pond (PUBFx).

## SITE INVESTIGATION PLAN

### TYPE OF WASTE:

- E&P Waste       Other E&P Waste       Non-E&P Waste
- Produced Water       Workover Fluids
- Oil       Tank Bottoms
- Condensate       Pigging Waste
- Drilling Fluids       Rig Wash
- Drill Cuttings       Spent Filters
- Pit Bottoms
- Other (as described by EPA) \_\_\_\_\_

### DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	GROUNDWATER	NA	Lab Analysis or Field Screening, if encountered
Yes	SOILS	Refer to Tables and Figures	Lab Analysis and Field Screening

### INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

A site investigation was conducted during the decommissioning of the Howard 14-18 Facility, Wellhead, and Flowline on 03/15/23. During the tank battery decommissioning, laboratory soil samples were collected from the base of the produced water vessel (PWV) excavation (PWV01-B@4'), and screening samples were collected from the sidewalls in each cardinal direction. The sidewall sample with the highest screening level was collected for lab analysis (PWV01-N@2.5'). Laboratory samples were also collected beneath the above-ground storage tank (AST01) and the separator risers for the dumpline (SEP01-DL) and the flowline (SEP01-FL). A field screening sample was collected beneath the meter house (MH01).

During the wellhead decommissioning, impacted material was encountered within the original excavation extents. A total of 4 cy of impacted material were removed, and the final excavation depth was approximately 8' below ground surface. A lab soil sample was collected at the base of the excavation to the top of the wellhead casing (WH01-B@8'), and screening samples were collected from the sidewalls in each cardinal direction. Three of the sidewall samples (WH01-N@2.5', WH01-N@4', & WH01-S@4') were submitted for laboratory analysis. Surface screening samples were collected outside the excavation extent (WHS01).

The entire length of the flowline (approximately 160') was removed per Form 44 # 403350409. A soil sample was collected below the flowline riser at the wellhead, which corresponds with wellhead decommissioning sample location WH01-S@4'.

Analytical results from the decommissioning samples indicate that concentrations of Table 915-1 organic compounds were below regulatory standards, and the impacts encountered at the wellhead were successfully removed. Groundwater was not encountered during the decommissioning.

### PROPOSED SAMPLING PLAN

#### Proposed Soil Sampling

Will soil samples be collected as part of this investigation? ( Number, type (grab/composite), analyses, and locations of samples ):

Soil samples were collected as described in the Initial Action Summary of this Form 27. Sampling deviated from the approved sampling plan in Initial Form 27 # 403065592 because the only samples analyzed for all Table 915-1 contaminants were WH01-B@8' and WH01-N@4'. Soil samples were analyzed by a certified laboratory for a combination of TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil per ECMC Table 915-1, EC, SAR, pH, metals, and/or boron.

#### Proposed Groundwater Sampling

Will groundwater samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

If groundwater is encountered during the site investigation, a grab groundwater sample will be collected and analyzed for all organic and inorganic compounds per ECMC Table 915-1. This sample analysis includes, but is not limited to: BTEX, naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260; chloride and sulfate anions by EPA Method 300.0; and total dissolved solids (TDS) by Method SM 2540C.

### Proposed Surface Water Sampling

Will surface water samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

### Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

Visual inspection of the tank battery, wellhead, and flowline occurred during decommissioning activities. Field personnel screened all disturbed areas using visual and olfactory senses to determine if laboratory confirmation sampling was required. A detailed summary of the initial decommissioning, including field notes, site photos, figures, and laboratory analytical results, was submitted under Form 27 # 403391800.

## SITE INVESTIGATION REPORT

### SAMPLE SUMMARY

#### Soil

Number of soil samples collected 0  
Number of soil samples exceeding 915-1 0  
Was the areal and vertical extent of soil contamination delineated? No  
Approximate areal extent (square feet) 200

#### NA / ND

ND Highest concentration of TPH (mg/kg) \_\_\_\_\_  
-- Highest concentration of SAR 1.12  
BTEX > 915-1 No  
Vertical Extent > 915-1 (in feet) 8

#### Groundwater

Number of groundwater samples collected 0  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) \_\_\_\_\_  
Number of groundwater monitoring wells installed \_\_\_\_\_  
Number of groundwater samples exceeding 915-1 \_\_\_\_\_

Highest concentration of Benzene (µg/l) \_\_\_\_\_  
Highest concentration of Toluene (µg/l) \_\_\_\_\_  
Highest concentration of Ethylbenzene (µg/l) \_\_\_\_\_  
Highest concentration of Xylene (µg/l) \_\_\_\_\_  
Highest concentration of Methane (mg/l) \_\_\_\_\_

#### Surface Water

0 Number of surface water samples collected  
       Number of surface water samples exceeding 915-1  
If surface water is impacted, other agency notification may be required.

### OTHER INVESTIGATION INFORMATION

Were impacts to adjacent property or offsite impacts identified?

Were background samples collected as part of this site investigation?

Between 03/15/23 and 04/16/24, a total of 39 background soil samples were collected from sampling locations BKG01-BKG08. Backgrounds were collected between 2.5' and 10' below ground surface and analyzed for either all Table 915-1 metals or arsenic. The maximum background concentration of arsenic with a 1.25x multiplier applied was 2.18 mg/kg. The arsenic concentrations observed at sample locations WH01-S@4' and WH01-N@4' exceed background concentrations and cannot be attributed to native soil conditions.

Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) \_\_\_\_\_ Volume of liquid waste (barrels) \_\_\_\_\_

Is further site investigation required?

A site investigation will be conducted to confirm Table 915-1 compliance for all decommissioning sample locations and collect additional background samples. Soil borings BH01-BH08 will be advanced to collect each prior decommissioning sample to confirm Table 915-1 compliance. Confirmation soil samples will be analyzed for all Table 915-1 contaminants. Background samples will be collected from soil borings BKG09-BKG13 to determine if any Table 915-1 metals, pH, SAR, EC, and/or boron exceedances can be attributed to native soil conditions. The proposed soil sample locations are illustrated in Figures 1 and 2 of the site investigation plan attached to this Form 27.

In comparison to the proposal in prior Form 27 # 404065198, the updated site investigation proposal above includes fewer sample locations and changes the background sampling plan. The new proposal removes Table 915-1 confirmation sampling locations corresponding with field screening samples collected during the initial decommissioning efforts (WH01-E, WH01-W, PWV01-W, PWV01-E, and PWV01-S). The updated proposal also removes all confirmation sampling locations corresponding with the soil boring samples from the prior site investigations, as delineation of the arsenic is not necessary for closure. The proposed site investigation includes an additional background boring (BKG13) and changes the locations of the background soil borings to provide a wider cross-section of the native soil conditions surrounding the site.

## REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes \_\_\_\_\_

### SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

During the decommissioning on 03/15/23, approximately 4 cubic yards of impacted material were excavated from the wellhead and transported to the North Weld Waste Management Facility in Ault, CO, for disposal under a PDC waste manifest. Analytical results indicate that the hydrocarbon impacts were successfully removed, and only arsenic exceedances remained.

Soil borings SB01-SB05 were advanced on 10/10/23 to delineate the extent of the arsenic exceedances observed in soil samples WH01-B, WH01-N, and WH01-S. Confirmation sample SB01@8.5' was collected to vertically delineate the exceedance at sample location WH01-B@8'. Soil borings SB02-SB05 were advanced in each cardinal direction around SB01 to vertically and laterally delineate the arsenic at that location, and samples were collected between 6' and 9' below ground surface (bgs). Delineation samples were analyzed for arsenic. Groundwater was not encountered. Analytical results demonstrated that the decommissioning sample locations with arsenic concentrations greater than background levels were successfully delineated. Though vertically delineated, the arsenic exceedance observed at sample location SB03@5' required further lateral delineation. The results of the 4Q23 site investigation were reported in Form 27 # 403617517.

### REMEDICATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

A site investigation was conducted on 04/16/24 to further delineate the arsenic exceedance at sample location SB03@5'. Soil borings SB06-SB08 were advanced to the N, S, and W of soil boring SB03 to gain lateral delineation, and samples were collected from 5' to 6' bgs. Delineation samples were analyzed for arsenic. Analytical results demonstrated lateral and vertical delineation for all arsenic exceedances on site. All soil samples were below 1.25x the peak background arsenic concentrations, except for soil samples WH01-N@4' and WH01-S@4'. Groundwater was not encountered. The results of the 2Q24 site investigation were reported in Form 27 # 403617517.

Following the 2Q24 site investigation, further investigation is needed to ensure Table 915-1 compliance. The only samples analyzed for all Table 915-1 contaminants to date were WH01-B and WH01-N. The arsenic concentrations observed at sample locations WH01-S@4' and WH01-N@4' exceed background concentrations and cannot be attributed to native soil conditions.

A site investigation will be conducted to gain Table 915-1 compliance, confirm the remaining exceedances, and collect additional background samples. The proposed soil sample locations are illustrated in the site investigation plan attached to this Form 27. The proposed site investigation will be conducted per the proposed implementation schedule, and the results will be provided in a subsequent Form 27.

### Soil Remediation Summary

In Situ

Ex Situ

<input type="checkbox"/> Bioremediation ( or enhanced bioremediation )	Yes <input type="checkbox"/> Excavate and offsite disposal
<input type="checkbox"/> Chemical oxidation	If Yes: Estimated Volume (Cubic Yards) _____ 4
<input type="checkbox"/> Air sparge / Soil vapor extraction	Name of Licensed Disposal Facility or ECMC Facility ID # _____
<input type="checkbox"/> Natural Attenuation	<input type="checkbox"/> Excavate and onsite remediation
<input type="checkbox"/> Other _____	<input type="checkbox"/> Land Treatment
	<input type="checkbox"/> Bioremediation (or enhanced bioremediation)
	<input type="checkbox"/> Chemical oxidation
	<input type="checkbox"/> Other _____

### Groundwater Remediation Summary

Bioremediation ( or enhanced bioremediation )

Chemical oxidation

Air sparge / Soil vapor extraction

Natural Attenuation

### GROUNDWATER MONITORING

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

Groundwater was not encountered during initial decommissioning activities or during supplemental site investigation activities at the former Howard 14-18 Wellhead and Tank Battery.

### REMEDIATION PROGRESS UPDATE

#### PERIODIC REPORTING

**Approved Reporting Schedule:**

Quarterly     Semi-Annually     Annually     Other

**Request Alternative Reporting Schedule:**

Semi-Annually     Annually     Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

**Report Type:**     Groundwater Monitoring     Land Treatment Progress Report     O&M Report  
 Other Updated Site Investigation Proposal

#### Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).  
If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Operator does not have site-specific financial assurance for this project; however, Operator has inactive well, blanket, and surface bonding including Surety IDs 106077122, 106473808, and 106473820, as well as commercial general liability and/or umbrella/excess insurance meeting the requirements of Rule 705.b. Operator does not anticipate making an insurance claim for this project.

- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 1000 Series.
- Investigation and delineation is complete for organics in soil.
- Investigation of arsenic is ongoing.

Costs included herein are estimates only and may change over time based on numerous factors. Accordingly, Operator makes no guarantees as to the accuracy of such cost estimates, thus providing an estimate for the next year below.

Operator anticipates the remaining cost for this project to be: \$ 15000

#### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? Yes

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

No beneficial use.

Volume of E&P Waste (solid) in cubic yards 4

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC Disposal Facility: North Weld Waste Management Facility

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description \_\_\_\_\_

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC Disposal Facility: \_\_\_\_\_

# REMEDIATION COMPLETION REPORT

## REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No \_\_\_\_\_

If YES:

Compliant with Rule 913.h.(1).

Compliant with Rule 913.h.(2).

Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

Does Groundwater meet Table 915-1 standards? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

## RECLAMATION PLAN

### RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

Following tank battery, wellhead, and flowline abandonment activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with the ECMC 1000 Series Rules.

Is the described reclamation complete? Yes \_\_\_\_\_

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim  Final

Did the Surface Owner provide the seed mix? \_\_\_\_\_

If YES, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 03/15/2023

Proposed date of completion of Reclamation. 01/13/2027

## IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. 04/28/2022

Actual Spill or Release date, or date of discovery. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/23/2022

Proposed site investigation commencement. 07/08/2025

Proposed completion of site investigation. 01/13/2026

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 01/13/2026

Proposed date of completion of Remediation. 07/13/2026

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

The implementation schedule was updated for the Howard 14-18 Wellhead and Tank Battery to reflect a change in start work dates. In prior Form 27 # 404065198, a tentative start work date was not provided for the proposed site investigation. The updated site investigation proposed in the Site Investigation Report section of this Form 27 has been tentatively scheduled for 01/13/26. The ECMC will be notified of any updates to the implementation schedule in a subsequent Form 27.

**OPERATOR COMMENT**

This Form 27 is being submitted to include an updated site investigation proposal for the Howard 14-18 Tank Battery, Flowline, and Wellhead. The initial decommissioning efforts were reported in Form 27 # 403391800. The 4Q23 site investigation results were reported in Form 27 # 403617517. The 2Q24 site investigation results were reported in Form 27 # 403850840.

A site investigation will be conducted to confirm Table 915-1 compliance for all decommissioning sample locations and collect additional background samples. Soil borings BH01-BH08 will be advanced to collect each prior decommissioning sample to confirm Table 915-1 compliance. Confirmation soil samples will be analyzed for all Table 915-1 contaminants. Background samples will be collected from soil borings BKG09-BKG13 to determine if any Table 915-1 metals, pH, SAR, EC, and/or boron exceedances can be attributed to native soil conditions. The proposed soil sample locations are illustrated in Figures 1 and 2 of the site investigation plan attached to this Form 27.

In comparison to the proposal in prior Form 27 # 404065198, the updated site investigation proposal above includes fewer sample locations and changes the background sampling plan. The new proposal removes Table 915-1 confirmation sampling locations corresponding with field screening samples collected during the initial decommissioning efforts (WH01-E, WH01-W, PWV01-W, PWV01-E, and PWV01-S). The updated proposal also removes all confirmation sampling locations corresponding with the soil boring samples from the prior site investigations, as delineation of the arsenic is not necessary for closure. The proposed site investigation includes an additional background boring (BKG13) and changes the locations of the background soil borings to provide a wider cross-section of the native soil conditions surrounding the site.

The implementation schedule was updated for the Howard 14-18 Wellhead and Tank Battery to reflect a change in start work dates. In prior Form 27 # 404065198, a tentative start work date was not provided for the proposed site investigation. The updated site investigation proposed in the Site Investigation Report section of this Form 27 has been tentatively scheduled for 01/13/26. The ECMC will be notified of any updates to the implementation schedule in a subsequent Form 27.

Site investigation activities will be conducted per the proposed implementation schedule, and the results will be included in a subsequent Supplemental Form 27. Per ECMC Rule 913.e, quarterly reporting will be conducted until closure criteria are achieved for the remediation project.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Eric Vonde

Title: Environmental Consultant

Submit Date:

Email: evonde@tasman-geo.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved:

Date:

Remediation Project Number: 23602

**COA Type**

**Description**

0 COA	
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**ATTACHMENT LIST**

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

**Att Doc Num**

**Name**

404328104	SITE INVESTIGATION PLAN
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Total Attach: 1 Files

**General Comments**

User Group

Comment

Comment Date

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)