

01-18-017-18W4M
GAS/GAS EXCHANGER
A0190928
REPORT # A#0190928_GRADY INSPECTION LTD VE VI UT INSP_2MAY2022

| | |
|--------|----------|
| DATE | 5/2/2022 |
| CLIENT | CNRL |

Phone:403-793-7697
PO Box 1173, Brooks,
Alberta, T1R 19B
grady.rustebakke@gmail.com




| PRESSURE EQUIPMENT | | | | | | | | | | AB-506 INTERVAL | | | | | | | | |
|--------------------|--|--|--|----|------|----------|----|----------|-----|---|--------------------|----|-------|-----|----|-----|----|----|
| DISTRICT | | AB - OIL & NATURAL GAS | | | | SHELL | | TUBE | | Refrigeration Vessels | | | | | | | | |
| FACILITY | | Armada Gas Plant | | | | MAWT | | 150 | 150 | F | GRADE | | YEARS | | | REG | | |
| A# | | A0190928 | | YR | 1984 | MAWP | | 685 | 685 | psi | 3 | | Equip | PSV | UT | | | |
| SERIAL # | | | | | | PSV | | | | psi | | | | | | | | |
| CRN | | F0736.2 | | | | PSV CRN | | | | | | | | | | | | |
| EQUIP# | | | | | | SERVICED | | | | | | | | | | | | |
| STATUS | | OUT OF SERVICE | | | | UNIT | | Refridge | | | | VE | | VI | MT | PT | ET | UT |
| | | | | | | | | | | | | X | | X | | | | X |
| MANUFACTURER | | ALCO GAS & OIL PRODUCTION EQUIPMENT LTD. | | | | | | | | | | | | | | | | |
| DH LSD | | | | | | L | Ft | OD | 2 | Ft | INSPECTION RESULT: | | | | | | | |
| REPAD | | UNIQUE ID | | | | | | | | NCR-OPERATIONS | | | | | | | | |
| | | | | | | | | | | NCR-REGULATORY/ADMIN | | | | | | | | |
| | | | | | | | | | | ACTION ITEM RAISED | | | | | | | | |
| | | | | | | | | | | REPAIR REQUIRED | | | | | | | | |
| | | | | | | | | | | SUITABLE FOR SERVICE | | | | | | X | | |
| | | | | | | | | | | RECOMMENDATIONS: | | | | | | | | |
| | | | | | | | | | | VE Inspection: Confirm Shell side pressure gauge is suitable for PSV set pressure or install new Pressure Gauge Install temperature gauge Inspect PSV after installation to confirm suitability. VI Inspection: | | | | | | | | |


RESULTS OF INSPECTION:


VE Inspection:
Fit For Service. Vessel is in good visual condition.
UT Inspection:
No corrosion was found with the ultrasonic inspection.
VI Inspection:
Fit For Service. Internal inspection conducted on channel sections only. No notable corrosion, erosion, mechanical damage or weld defects observed.
Minor visible solid build up in a few tubes. Will not affect process.

| SIGN OFF | | API 510 | EXP. | IPV | EXP. | INSPECTOR - PRIMARY | INSPECTOR - REVIEW | CLIENT SIGN OFF |
|--------------|----------------|---------|------------|--------|-----------|---------------------|--------------------|-----------------|
| INSPECTED BY | ToddM Mckenzie | 97445 | 12/31/2023 | 001336 | 7/13/2026 | | | |
| REVIEWED BY | ToddM Mckenzie | 97445 | 12/31/2023 | 001336 | 7/13/2026 | | | |

| | | | | | |
|---|-----------------|-----------------|-------------------|---|---|
| Ultrasonic Report | | Date | 3/25/2022 | Phone: 403-793-7697 PO Box 1173, Brooks, Alberta, T1R 19B grady.rustebakke@gmail.com |  |
| LSD | 01-18-017-18W4M | Facility | Armada Gas Plant | | |
| DH-LSD | | Field | Red Deer District | | |
| Jurisdiction # A0190928 | | | | | |
| Serial # | | | | | |
| Ultrasonic Report #: A#0190928_GRADY INSPECTION LTD VE VI UT INSP_2MAY2022 | | | | | |


| ULTRASONIC SET | | | COMPONENT DETAILS | | | | CODE | | | | | |
|-------------------|-----------------|---|-------------------|--------------|--------|-------|-----------|-------------|-----------------|-----------------|-----------|-----------|
| EQUIPMENT | CALIBRATION DUE | SERIAL NUMBER | MATERIAL GRADE | SURFACE PREP | | TEMP | THICKNESS | CALIBRATION | EVALUATION | | | |
| EPOCH 600 | 2/25/2023 | 120388107 | Carbon Steel | Painted | | 0C | | ASME V | ASME VIII Div 1 | | | |
| CALIBRATION BLOCK | | PROBE | | | | | | | COUPLING | | METHOD | |
| TYPE | SERIAL# | REF dB | SCAN dB | FREQ. | SIZE. | ANGLE | SERIAL # | TYPE | COUPLANT | CABLE | TECHNIQUE | PROCEDURE |
| 10 Step Metric | 14-2065 | 60 | 66 | 5 Mhz | 0.25 " | 0 | 15B00DU3 | Dual | UT-X | 6' BNC to Micro | LW Dual | UT01T1R4 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| SCOPE | | As requested by Dustin Rumohr an ultrasonic inspection was completed on the GAS/GAS EXCHANGER | | | | | | | | | | |
| | | | | | | | | | | | | |
| LIMITATIONS | | None. | | | | | | | | | | |
| RESULTS | | No corrosion was found with the ultrasonic inspection. | | | | | | | | | | |

| | | | | | | | |
|------------------------|---------------------------|------------------------|---------------|-------------------------|---|--|--|
| Technician Name | Certification Body | Certification # | Expiry | Technician Signature |  | | |
| 3 ToddM | CGSB | 9234 | 12/15/2030 | | | | |
| | | | | Client Name | | | |
| | | | | Client Signature | | | |

| | | | | | |
|---------------------------------------|-----------------|-----------------|-------------------|--|--|
| External Inspection - (Vessel) | | Date | 3/25/2022 | Phone:403-793-7697 PO Box 1173, Brooks, Alberta, T1R 19B grady.rustebakke@gmail.com |  |
| LSD | 01-18-017-18W4M | Facility | Armada Gas Plant | | |
| DH-LSD | | Field | Red Deer District | | |
| Jurisdiction # | | A0190928 | | | |

| | |
|----------------------------|---|
| Fit For Service: | Fit For Service. |
| Inspection Summary: | Vessel is in good visual condition. |
| Recommendations: | Confirm Shell side pressure gauge is suitable for PSV set pressure or install new Pressure Gauge Install temperature gauge Inspect PSV after installation to confirm suitability. |

| External Inspection Items | G/F/P | Comments |
|----------------------------------|-------|--|
| General Condition: | Good | No notable mechanical damage, areas of wear/fretting, distortion, misalignment, or visible weld defects. |
| External Coating: | Good | Vessel is in good visual condition. |
| Insulation / Cladding: | Good | Insulation is in good visual condition. |
| Nozzles, Piping and Connections: | Good | Nozzles and piping in good visual condition |
| Buried Vessels: | N/A | Above Ground |
| Ladders, Platforms and Walkways: | Good | Building secure |
| Foundations and Supports: | Good | Unable to view saddle attachment to shell |
| Shell:. | Good | No notable mechanical damage, areas of wear/fretting, distortion, misalignment or visible weld defects. |
| Saddles / Skirts: | Good | Saddle is in good visual condition |
| Grounding: | Good | Grounded through the skid |
| Gauges and Instrumentation: | Fair | Shell Gauge (- @) Temp Gauge (- @) Shell side Pressure gauge is not suitable for MAWP Tube side pressure gauge is suitable for MAWP No temperature gauge found |
| Pressure Protection: | N/A | Protected through LTS. Out for service at time of inspection |
| NDE Summary: | Good | No corrosion was found with the ultrasonic inspection. |
| Manway Davits/Quick Closure: | N/A | No Manway |
| Nameplate: | Good | Nameplate is legible and readily accessible and securely affixed |
| Code Variance: | | |

| | | | | | |
|--------------------------------------|-----------------|-----------------|-------------------|--|--|
| Internal Inspection - (Vessel | | Date | 5/2/2022 | Phone:403-793-7697 PO Box 1173, Brooks, Alberta, T1R 19B grady.rustebakke@gmail.com |  |
| LSD | 01-18-017-18W4M | FACILITY | Armada Gas Plant | | |
| Jur # | A0190928 | FIELD | Red Deer District | | |
| Serial # | | | | | |

| | |
|-------------------------|------------------|
| Fit For Service: | Fit For Service. |
|-------------------------|------------------|

| | |
|--|--|
| Inspection Summary: Overview of Inspection Findings | Internal inspection conducted on channel sections only. No notable corrosion, erosion, mechanical damage or weld defects observed. Minor visible solid build up in a few tubes. Will not affect process. |
|--|--|

| Internal Inspection Items | | G/F/P | Comments |
|---------------------------------------|-------|-------|--|
| Inlet Area: | | Good | No notable corrosion, erosion, mechanical damage or weld defects observed. |
| Internal Piping: | | N/A | No internal piping. |
| Baffles, Deflector Plates, Weir, etc: | | N/A | No baffles, weirs or deflector plates. |
| Trays: | | N/A | No trays. |
| Demister Pad: | | N/A | No demister pad. |
| Head (1): | North | Good | Blind flange. No erosion, corrosion or mechanical damage observed. |
| Head (2): | South | Good | Blind flange. No erosion, corrosion or mechanical damage observed. |
| Shell: | | N/A | Fully insulated. |
| Tubesheet: | | Good | Rolled attachment method. No erosion, corrosion or mechanical damage observed. Viewed from tube side only. |
| Channel Section: | | Good | Both North and South channels are in good visual condition. No notable corrosion, erosion, mechanical damage or weld defects observed. |
| Bundle / Tubes: | | Good | Minor visible solid build up in a few tubes. Will not affect process. |
| Nozzles / Manways: | | Good | No notable corrosion, erosion, mechanical damage or weld defects observed. |
| Welds: | | Good | No weld defects observed. |
| Vortex Breakers, Drains, etc: | | N/A | |

| | | |
|--------------------------|-----|---|
| Internal Coating: | N/A | <input checked="" type="checkbox"/> NotCoated |
| | | <input type="checkbox"/> Coated |
| | | <input type="checkbox"/> CoatingFailure |
| | | <input type="checkbox"/> Blisters |

Internal Inspection - (Vessel)**LSD** 01-18-017-18W4M**Jur #** A0190928**Serial #****Date**

5/2/2022

FACILITY

Armada Gas Plant

FIELD

Red Deer District

Phone:403-793-7697

PO Box 1173, Brooks,
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grady.rustebakke@gmail.com**GRADY**
INSPECTION LTD☐ Cracks/Flake☐ Repaired☐ Replaced**Weld Repairs:**☐ Weld Repairs Required☒ None Required**Internal Anodes:**☐ Internal Anodes ☒ None**Non-Conformances and Corrective Actions:****Preparatory Work Required for Next Inspection:****Recommendations for Next Inspection:**

Overview Photo

LSD 01-18-017-18W4M
Jur # A0190928
Serial #

Date

5/2/2022

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GRADY
INSPECTION LTD



Shellside Nameplate



Overview



Tubeside Nameplate



Overview

Overview Photo

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Typical Nozzle



Anchor Bolt



North overview



North End - minimal solid build up in tubes.

Overview Photo

LSD 01-18-017-18W4M
Jur # A0190928
Serial #

Date

5/2/2022

FACILITY

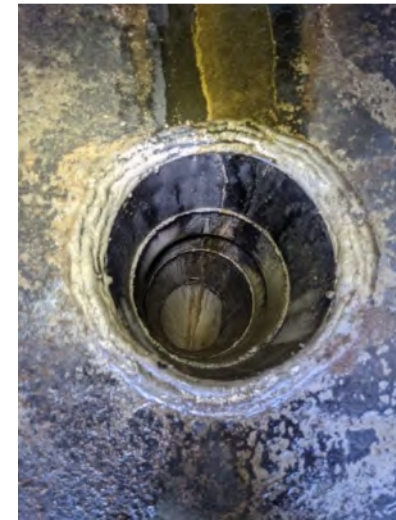
Armada Gas Plant

FIELD

Red Deer District

Phone:403-793-7697

PO Box 1173, Brooks,
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GRADY
INSPECTION LTD**Manway Cover****Typical Nozzle****South Overview****Manway Cover**

Overview Photo

LSD 01-18-017-18W4M
Jur # A0190928
Serial #

Date

5/2/2022

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South end. minimal solid build up in tubes.

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LSD 01-18-017-18W4M

FACILITY Armada Gas Plant

DH-LSD

Jur # A0190928

FIELD Red Deer District

DWG 1

Location:

Phone:403-793-7697

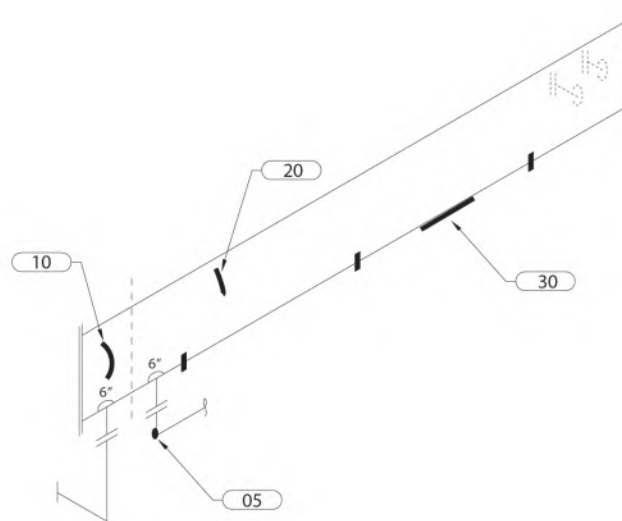
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GRADY
INSPECTION LTD

Ser #

Inspection Dates and Thickness Values (mm)

| CML# | Nom | CA/Tol | SFlag | STmin | PTmin | > Tmin | Comp | Type | Pipe Size | Code | MOP | Baseline | | 3rd Last | | 2nd Last | | Last | | # of Insp | Nom Wall Loss | Corrosion Rates | | | Rem Life Date | Rem Life (yrs) | Next Insp Date | Insp (yrs) | Inspection Comments |
|------|-----|--------|-------|-------|-------|--------|------|------|-----------|------|-----|----------|---------|----------|---------|----------|---------|------|---------|-----------|---------------|-----------------|-----|-----|---------------|----------------|----------------|------------|---------------------|
| | | | | | | | | | | | | Date | Min Ave | Date | Min Ave | Date | Min Ave | Date | Min Ave | | | ST | LTn | LTi | | | | | |



| CML | Min | Yrs | Date |
|-----|-----|-----|------|
|-----|-----|-----|------|

Date of Print
8/18/2022

| Nominal (mm) | Pipe Tolerance 12% (mm) Corrosion Allowance (mm) | API 574 Table 7 Flag Tmin | Pressure Tmin Structural Tmin |
|-----------------|---|------------------------------|----------------------------------|
|-----------------|---|------------------------------|----------------------------------|

| | | |
|-------------|-------|-------|
| %Nom -UT | 10-20 | 20-30 |
| | 30-50 | >50 |

| | | |
|-----------------------|--------------|------------|
| Cor. Rates (mm/yr) | 0.025 - 0.25 | 0.26 - 0.5 |
| | 0.501 - 1 | >1.0 |

| | | |
|----------------------------|-----|-----|
| Calculated Failure (years) | 3-5 | 2-3 |
| | 1-2 | < 1 |

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LSD 01-18-017-18W4M FACILITY Armada Gas Plant
DH-LSD FIELD Red Deer District
Jur # A0190928 DWG 1 Location:
Ser #

Phone:403-793-7697

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| Ser # | Inspection Dates and Thickness Values (mm) | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|--|--------|-------|-------|-------|--------|-------|------|-----------------|--------------|-----|----------|----------|----------|--------|------|------|-----------------|------|-----|-----------|------|-----------|------------|--|
| CML# | Nom | CA/Tol | SFlag | STmin | PTmin | > Tmin | Comp | Type | Pipe Size | Code | MOP | Baseline | 3rd Last | 2nd Last | Last | # of | % | Corrosion Rates | Rem | Rem | Next | Insp | Insp | Inspection | |
| | | | | | | | | | | | | Date | Min | Ave | Date | Min | Ave | ST | LTn | LTi | Life | Life | Date | Comments | |
| 05 | 7.1 | 6.2 | 3.3 | 2.8 | 2.9 | 2.9 | Elbow | 6" | STD 40--(7.1mm) | API570 | 685 | 5/2/22 | 7.0 | 7.5 | | | 1 | 1% | 0.00 | | 1/5/3601 | | 4/29/2032 | 10.0 | |
| 10 | 17.5 | 17.4 | 27.0 | | 13.5 | 13.5 | Shell | | | UG27ShellInt | 685 | 5/2/22 | 16.4 | 16.7 | | | 1 | 6% | 0.03 | | 6/19/2127 | | 4/29/2032 | 10.0 | |
| 20 | 17.5 | 17.4 | 27.0 | | 13.5 | 13.5 | Shell | | | UG27ShellInt | 685 | 5/2/22 | 17.2 | 17.5 | 5/2/22 | 17.0 | 17.3 | 2 | 3% | | | | 4/29/2032 | 10.0 | |
| 30 | 17.5 | 17.4 | 27.0 | | 13.5 | 13.5 | Shell | | | UG27ShellInt | 685 | 5/2/22 | 17.5 | 17.8 | 5/2/22 | 17.4 | 17.7 | 2 | 0% | | | | 4/29/2032 | 10.0 | |