Husky Energy

Tank Visual Inspection Report

Foreman: J. Grocock	Location: 01-21-038-02W5M
Area: Sylvan Lake Plant	Operations Rep: Dustin Conly
Inspector: N. Schmidt	Inspect Date: Nov 12, 2015

STATIC DATA

Equipment Inspected: Lean Oil Storage Tank TK-552 WO# 60008106		
Process: Lean Oil	Volume: 750 BBL - 119.2 m3	
Manufacturer: Universal Industries Corp.	Mfr. Date: 2005	
Construction Code: API 650	Roof Girder System: Internal ☐ External ☐ N/A ☑	
Serial #: 05-04-06-13848	SAP# 66096450	INV. #: 213343
Double Wall: Y ☐ N ☑	Insulated: Y ☐ N ☑	
Roof Thick: 3/16" - 4.76 mm	Material: A36	
Wall Thick: 1/4" - 6.35 mm	Material: A36	
Floor Thick: 1/4" - 6.35 mm	Material: A36	
Elevated: Y ☐ N ☑	Secondary Containment Type: Steel Wall with liner	
Internal Coating: Y ☐ N ☑	Type / Brand: N/A	
Height: 18'	Diameter: 17'3"	

OVERALL EQUIPMENT CONDITION SUMMARY

Inspect Type : Internal Visual ☑ External Visual ☑ UT ☑ Other ☐	
Repair Required: Y ☐ N ☑	Post Repair Inspect Required: Y ☐ N ☑
Re-Inspect: Y ☐ N ☑	Recommended Inspect Interval: 10 Yr.
Suitable For Continued Service: Y ☑ N ☐	In Accordance With Code: API 650
Report Is: Partial ☐	Preliminary ☐ Final ☑
Prepared By: N. Schmidt	Approved By: Dustin Conly
Review Date: Nov 18, 2015	Next Inspection Date: 2025

Comments / Recommendations:

This 750 BBL Lean Oil tank is fit for continued service in it's present application. Based on this condition an inspection interval has been set at 10 years for the next thorough inspection unless the tank is moved or the service conditions change at which time an internal may be required. Continue external monthly inspection as required.

Norm Schmidt IPVI #000362 / API #24957

Inspector's Signature

Site Supervisor's Signature

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ITEM	SEVERITY				CONDITION / COMMENTS
	NA	1	2	3	
INTERNAL					
ANODES	✓				
BOLTING / PIPING		✓			Clean, Secure & intact
COATING	✓				
DEMISTER	✓				
DRAINS		✓			
FLOOR _			✓		Good condition
GAUGE CABLES		✓			Tight & secure- Connected to floor eyelets
LADDERS	✓				
LEVEL CONTROLS		✓			Radar & Float plus Hi Level Trip
MIXERS	✓				
NOZZLES		✓			Clean - no corrosion or pitting observed
ROOF		✓			Good condition as viewed from floor
ROOF SUPPORTS	✓				
SCALE / DEPOSITS		✓			Minor overall on shell & floor sections
SIPHONS		✓			
SKIMMER	✓				
SUMP	✓				
WALLS / SHELL		✓			Clean - no warping or distortion
WELDMENTS		✓			Clean smooth profile
EXTERNAL					
ANCHOR BOLTS	✓				Current anchors not used
CATHODIC PROTECTION	✓				
COATING / PAINT		✓			Good Original Condition
DIKES / BERM		✓			Steel corrugated wall with liner
FIREPROOFING	✓				
FLANGE / GASKET FACES		✓			
FOUNDATION		✓			Tank Not elevated - gravel pad
GASKETS		✓			
GRATING	✓				
GROUND CABLE		✓			Visible & Intact
HANDRAILS / LADDERS		✓			Secured and stable
INSULATION / CLADDING	✓				
MANWAYS		✓			24" x 36" - Two piece
NAMEPLATE		✓			Intact & ledgible
NOZZLES / REPADS		✓			Good condition - Weepholes free
OVERPRESSURE PROT.		✓			Thief Hatch - Gasket good
SUPPORTS				✓	Inlet & outlet piping need support
WALLS / SHELL		✓			No noticable distortion or warping

NA: Not Applicable **1: Requires No Attention** **2: Requires Monitoring** **3: Requires Repair**

Consider: *Pitting, erosion, corrosion, mechanical damage, distortion, scale, deposits, leaks, blisters, bulges, tight, loose, missing, spalling, plugged, weeping.*

ADDITIONAL INFORMATION:

Vertical 750 BBL tank is single wall, un-insulated & supported on gravel pad in sweet service & currently in operation. Inspection performed under WO# 60008106

External - Tank is not elevated above grade and sits on gravel base within steel wall secondary containment. Internal access is via 24" x 36" side wall 2- piece manway. External shell adequately protected with original yellow paint in good condition with no noticeable areas of damage. Tank chime area partially exposed in areas but others need gravel/soil removed. This work was requested and completed at time of inspection. Shell consists of two courses of which the lower 10' is 1/4" thick & top 8' is 3/16" thickness. Both courses appear in good condition with no significant areas of distortion or deformation. Ladder with safety cage is solid, secure & intact . External nozzle connections/flanges appear secure, however, attached piping is not adequately supported. Inlet & outlet piping supports have settled & no longer provide weight support which is putting undue stress on flex connections. Shims need to be installed on support shoes to fill gap. Underside of floor plate is not accessible, therefore, internal floor scan was performed during inspection. Roof vent intact & unobstructed. Thief hatch operational with gasket seal in place and good condition. Gage board intact, legible & appears operational. Tank has proper labeling to identify contents. Tank is not heated.

Internal - Shell, floor & roof uncoated and sufficiently cleaned for surface inspection. Majority of floor plate in good condition with accumulations of heavy scale around outer circumference. This could easily be scraped off revealing sound metal underneath with no indication of pitting. Floor lap welded seams in good condition exhibiting smooth clean profile. Streamline NDE performed MFL floor scan during inspection and results found no indication of underside corrosion or deterioration. Some areas of slight concern were proved out with UT with no issues or concerns. Composite material gageboard float displacer moves freely within guide cables anchored to floor and appears to function as designed. Shell/walls clean & in good condition. Minor scale deposits adhering in all areas of shell, however, easily scraped off and revealing sound un-corroded material below. Internal roof as viewed from floor appears in satisfactory condition with no obvious issues or structural deformation noted. Original manufacturing markings still visible on shell sections as seen in photos. Level indication provided by radar transmitter as well as local gage board and Hi-Level float trip in upper shell nozzle. Other internal nozzles, flange faces, siphons & standpipe all in good condition with no indications of corrosion or deterioration.

Tank is in overall very good condition with no signs of damage or leakage.

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Tank Visual Inspection Report

Overview

Nameplate.

Surface scale scraped away leaving smooth original plate finish.

Floor lap joint fillet weld.

Original paint & inventory markings still visible on shell.

Overall floor & internal nozzles. No pitting or corrosion found.

* Additional inspection photos available on file.

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Job #15-549

MFL FLOOR INSPECTION

SAP-66096450

Sylvan Lake Gas Processing Facility
01-21-38-02-W5M

Streamline Inspection Ltd.

11/12/2015

This document contains the API 653 inspection information for tank SAP-66096450, located at Sylvan Lake Gas Processing Facility (01-21-38-02-W5M). Please contact us if there are any questions or comments regarding this report. Thank you for the opportunity to be of service to Husky Energy.

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1. INTRODUCTION

TABLE 1 NAME PLATE DATA

API Edition:	650 Mod. App. F	Tank No.	TK-552
Nominal Diameter:	17’ – 3”	SAP No.	66096450
Nominal Height:	18’ – 0”	STK No.	213343
Nominal Capacity:	750 BBL	Serial No.	05-04-06-13848
Bottom Thickness:	1/4”	Year Built:	2005
Shell Thickness:	1/4” – 3/16”	Design Pressure:	10 oz.
Deck Thickness:	3/16”	Manufactured By:	Universal Industries

TABLE 2 TANK DATA

Bottom Plate Weld Detail:	Butt Weld	Shell Plate Weld Detail:	Butt Weld
Bottom Plate Coating:	None	Roof Type:	Fixed
Bottom Plate:	Flat	External Coating:	Paint

2. INSPECTION SCOPE

Scope of work is to be performed as described in the Husky Energy description of work. For areas of work not covered in the above specified document, the Streamline Inspection Ltd scope of work shall be followed.(Note: In areas of overlap between the Streamline scope of work and the Husky Energy scope of work, the Husky Energy scope of work shall be followed.)

2.1 Bottom Plates

A Magnetic Flux Leakage scan will be performed on the bottom plates in all accessible areas using MFL technology. Areas not accessible for MFL scanning include: areas of rough coating, under piping, floats, skimmers, water/product or surface profile.

Ultrasonic thickness testing is to be performed in areas, which were inaccessible to the MFE scanner. (i.e. Sump, under piping, critical zone, lap welded joints, areas of extensive edge settlement, etc.) In the presence of thick film fibreglass coatings ultrasonic thickness readings are only taken in areas of coating removal.

Ultrasonic / visual prove up of all MFE indications identified in the MFE scan of the bottom / annular ring plates. (Ultrasonic examinations are not able to be performed in areas with a thick film fibreglass coating present, only areas of coating removal can be examined.)

Complete bottom plate layout drawing.

2.2 Miscellaneous

Repair recommendations, remaining life, and inspection interval.

3. REMAINING LIFE ESTIMATION

Years in service: 10

Is tank internally coated? Yes ☐ No ☒ Is lined with: Epoxy ☐ Fiberglass ☐

Is internal lining effective? Yes ☐ No ☐

Is leak detection and containment present in berm? Yes ☒ No ☐ Is a berm liner present: Yes ☒ No ☐

Table 4.4—Bottom Plate Minimum Thickness

Minimum Bottom Plate Thickness at Next Inspection (in.)	Tank Bottom/ Foundation Design
0.10	Tank bottom/foundation design with no means for detection and containment of a bottom leak.
0.05	Tank bottom/foundation design with means to provide detection and containment of a bottom leak.
0.05	Applied tank bottom reinforced lining, > 0.05 in. thick, in accordance with API 652.

Nominal Plate thickness:	0.250 inch
Year of tank bottom plate installation:	2005
Deepest bottom side pit remaining after repairs: 	0.00 inch
Deepest product side pit remaining after repairs: 	0.000 inch
Minimum remaining thickness from bottom side corrosion after repairs (RTbc):	0.250 inch
Minimum remaining thickness from topside corrosion after repairs (Rtip):	0.250 inch
Maximum rate of corrosion not repaired on the bottom side:	0.000 inch
Maximum rate of corrosion not repaired on the topside:	0.000 inch
Duration until the next scheduled out-of-service inspection:	5 years
Minimum remaining thickness at the end of interval: **This value must meet the requirements in API Standard 653 Table 4-4. (MRT).**	0.250 inch
Estimated time to reach the minimum allowable bottom plate thickness **(as stated in API Standard 653 Table 4-4)**	10+ years
Next internal inspection:	2020
Next external inspection:	2020

Note: StPr = 0 in areas with effective coatings, the expected life of the coatings must be greater than or equal to StPr.

4. INSPECTION RESULTS

4.1 Tank Bottom Evaluation

An MFL floor scan was performed on all bottom plates where accessible. As a result of the floor scan, zero (0) underside indications were observed at time of inspection.

Random UT was conducted throughout, no major thickness loss was observed as a result.

A nominal thickness of 0.250 inch was recorded.

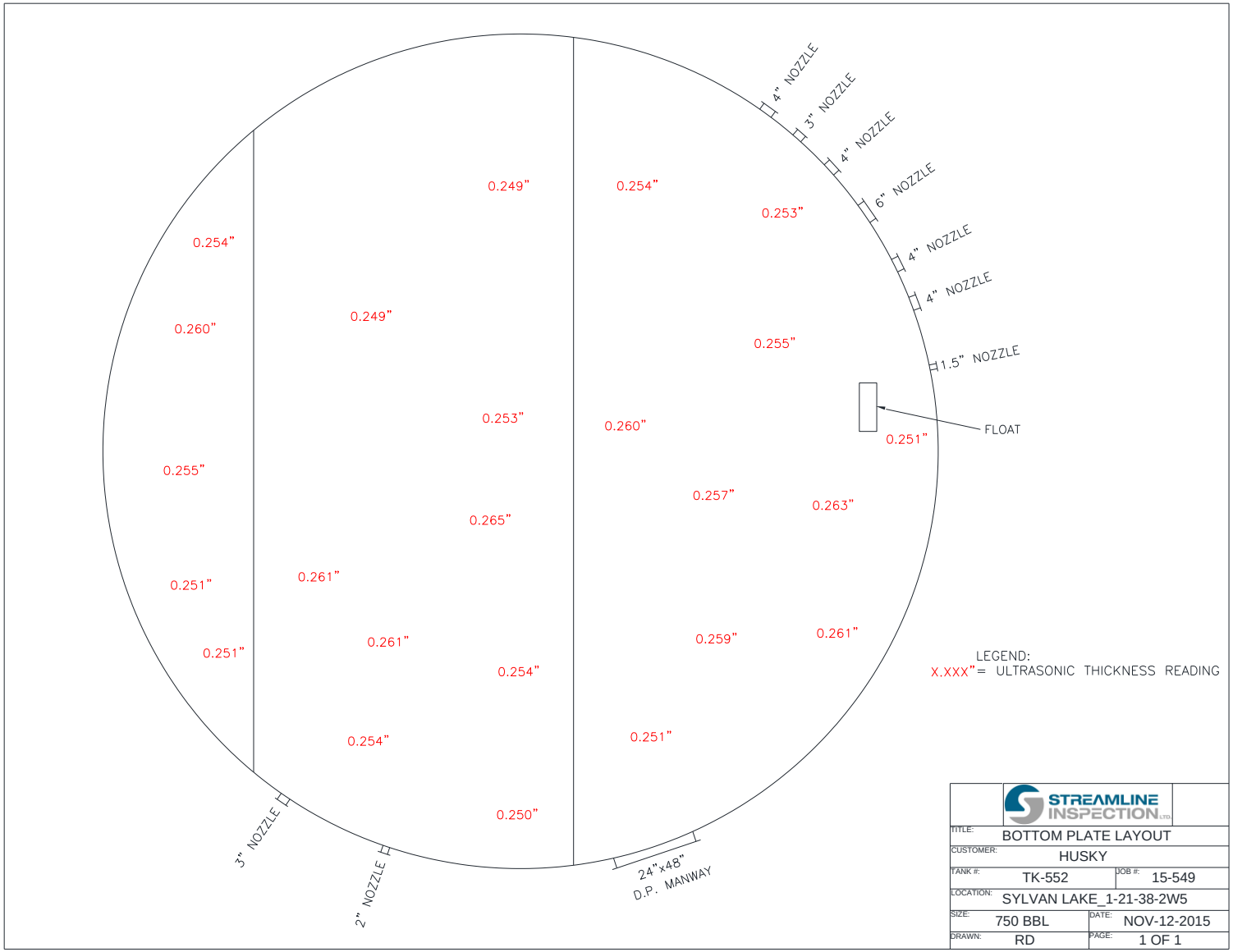

FIGURE 1 BOTTOM PLATE LAYOUT

5. CONCLUSIONS AND RECOMMENDATIONS

There are no recommendations at this time of inspection.

Prepared By

Darrin Robak – NDE Technician

Reviewed By

Brian Boulet - API 653

APPENDIX A – CREW CERTIFICATIONS, PROCEDURES AND EQUIPMENT

Name	API 653	API 510	NDE	UT	PT	MT	RT	CWB	NACE	SNT	MFE/ MFL	Signature
Brian Boulet	30213	28357						Level-2 5209	21726		201102	
Darrin Robak				CGSB-1 19641								

Procedure Name	Procedure Number
Streamline Visual Inspection Procedure	NDE-002 2010 Edition
Streamline Magnetic Flux Exclusion Procedure	NDE-001 2010 Edition
Ultrasonic Thickness Procedure	UT-1

Unit #7

Equipment Used	Serial Number	Model Number	Last Calibration Date
EPOCH 4 UT Set	071538005		Dec 30, 2014
MFE Mark 2	MK2-1	MK2	Function Test Prior to Use
DMS Go	USM6013046069		Dec 30, 2014
MT Yoke		P2 Contour Probe	Dec 30, 2014