



## STATE OF WISCONSIN

Department of Agriculture, Trade, and Consumer Protection

Approval #2024001

Bureau of Weights and Measures  
Storage Tank Regulatory  
P.O. Box 7837  
Madison, WI 53707-7837

# Wisconsin ATCP 93 Material Approval

Equipment: TotalSIR Version 1.0

Manufacturer: TotalSIR, LLC  
158 Wellshire St  
Mooresville, NC 28115

Expiration of Approval: December 31, 2027

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### **SCOPE OF EVALUATION**

The TotalSIR Version 1.0 Statistical Inventory Reconciliation System, manufactured by TotalSIR LLC, for leak detection of tanks and connected piping, has been evaluated for use as a method of monthly monitoring complying with **ATCP 93.515(6)** of the current edition of the Wisconsin Flammable and Combustible Liquids Code.

This evaluation summary is condensed to provide the specific installation, application and operation parameters necessary to maintain the subject systems in compliance with the Wisconsin Administrative Code – ATCP 93.

## **DESCRIPTION AND USE**

The TotalSIR Version 1.0 Statistical Inventory Reconciliation System is a quantitative method that analyzes tank inventory records to detect leaks. The method estimates the leak rate and interprets the data as one of the following: Pass, Fail or Inconclusive.

The SIR system is capable of identifying and/or compensating for:

- Leak Rates  
(Identified and Quantified)
- Delivery Errors (Identify only)
- Unexplained Gains Or Losses  
(Identify only)
- Dispensing Meter Errors
- Calibration Errors
- Dipstick or Gauging Errors  
(Identify only)
- Conversion Chart Miscalibration
- Water Inflow Or Outflow  
(Identify only)
- Thermal Effects

Inventory data may be recorded manually or by use of an electronic or other tank monitor. Data that must be reported for leak detection analysis include:

- Measurement of product height and /or associated volume conversions for the days the tanks are in active operation.
- Deliveries or amount of product transferred to the tank by date and amount.
- A record of the amount of product dispensed from the tank system during each day of active use.

Leaks from either the tank or piping will show as losses. If a leak is indicated, the leak could be located in any portion of the tank system, including piping. Additional testing will be needed to isolate the location of the leak.

Inventory data may be submitted to TotalSIR recorded manually on paper or sent electronically via email.

The facility may be closed for one or more consecutive days during the week, but the inventory record under analysis must contain data from a minimum of 23 days of active use of the facility. Properly calibrated meters are required for use of the SIR system. This method is inadequate if there is an insufficient number of usable records or too much daily variability in the inventory records.


The TotalSIR Version 1.0 Statistical Inventory Reconciliation System may be used with gasoline, diesel fuel, kerosene, and other liquids with known coefficients of expansion and density after consultation with the manufacturer.

## TESTS AND RESULTS

The performance of the TotalSIR Version 1.0 Statistical Inventory Reconciliation System was determined in accordance with the EPA protocol for statistical inventory reconciliation methods. The system was found capable of detecting a 0.20- gph leak with a probability of detection greater than 99.9 percent and a probability of false alarm of less than 0.1 percent.

## SIR REPORT OUTPUT

Detailed here are examples of the typical report provided by TotalSIR to the SIR customer:



**SIR MONTHLY EVALUATION REPORT**

TotalSIR  
 P.O. Box 299  
 Reidsville, NC 27323

001 SIR Monthly Tank Evaluation Report		Date of Report: 12/18/2023	
FACILITY NAME		ID#	
TANK			
LOCATION		Tel:	
TANK OWNER			
LOCATION		Tel:	
TANK OPERATOR		Tel:	
SIR Provider		TotalsIR P.O. Box 299 Reidsville, NC 27323	
SIR Version		TotalsIR 1.0 <ID:SIR71005> Site Dir:54341	
Period Covered		11/16/2023 - 12/15/2023 23 usable days per month required.	

TANK				Current Period			11/16 2023	10/17 2023							
TotalsIR Tank Number	Product	Max. SIR size (gal)	size (gal)	Leak Thres hold (gph)	MDL rate (gph)	Calc. Leak rate (gph)	Pass, Fail, or Inconclusive								
							P	F	I	P	F	I	P	F	I
001	Regular	45 K	10000	0.054	0.109	0.025	X		X						
002	Premium	45 K	10028	0.083	0.167	0.041	X		X						

Person conducting evaluation		Deborah Medley	
Signature		Date	
I certify under penalty of law that I am familiar with the information submitted on this form and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete			
Signature of owner/operator: _____ Date: _____			



## EVALUATION REPORT

**TotalSIR**  
P.O. Box 299  
Reidsville, NC 27323

P.O. Box 299 • Reidsville, NC 27323

Dates Analyzed : 11/16/2023 - 12/15/2023  
Facility Name : XXXXXXXXXX  
Address : XXXXXXXXXX  
Site Directory : 54341  
Tank Number : 001  
Tank ID : Regular  
Tank Type : Steel  
Diameter (inch) : 0  
Capacity (gal) : 10,000  
Total Capacity : 10,000

Date	Delivery	Sales	In-Tank	On-Books	Variance	Cum.
11/16/2023		525.0	3,544.0	3,541.0	3.0	3.0
11/17/2023		428.0	3,112.0	3,116.0	-4.0	-1.0
11/18/2023		563.0	2,552.0	2,549.0	3.0	2.0
11/19/2023		343.0	2,221.0	2,209.0	12.0	14.0
11/20/2023		416.0	1,816.0	1,805.0	11.0	25.0
11/21/2023		534.0	1,287.0	1,282.0	5.0	30.0
11/22/2023	7,200.0	539.0	8,061.0	7,948.0	113.0	143.0
11/23/2023		290.0	7,768.0	7,771.0	-3.0	140.0
11/24/2023		604.0	7,158.0	7,164.0	-6.0	134.0
11/25/2023		367.0	6,796.0	6,791.0	5.0	139.0
11/26/2023		352.0	6,458.0	6,444.0	14.0	153.0
11/27/2023		583.0	5,871.0	5,875.0	-4.0	149.0
11/28/2023		366.0	5,524.0	5,505.0	19.0	168.0
11/29/2023		508.0	5,010.0	5,016.0	-6.0	162.0
11/30/2023		489.0	4,528.0	4,521.0	7.0	169.0
12/1/2023		674.0	3,837.0	3,854.0	-17.0	152.0
12/2/2023		558.0	3,287.0	3,279.0	8.0	160.0
12/3/2023		291.0	2,986.0	2,998.0	-10.0	150.0
12/4/2023		481.0	2,522.0	2,525.0	-3.0	147.0
12/5/2023		384.0	2,148.0	2,138.0	10.0	157.0
12/6/2023		408.0	1,732.0	1,740.0	-8.0	149.0
12/7/2023	7,301.0	519.0	8,614.0	8,514.0	100.0	249.0
12/8/2023		648.0	7,974.0	7,966.0	8.0	257.0
12/9/2023		409.0	7,558.0	7,565.0	-7.0	250.0
12/10/2023		427.0	7,127.0	7,131.0	-4.0	246.0
12/11/2023		406.0	6,732.0	6,721.0	11.0	257.0
12/12/2023		545.0	6,199.0	6,187.0	12.0	269.0
12/13/2023		491.0	5,708.0	5,708.0	-2.0	267.0
12/14/2023		616.0	5,093.0	5,090.0	3.0	270.0
12/15/2023		731.0	4,363.0	4,362.0	1.0	271.0
12/16/2023						
Sum:	14,501.0	14,475.0				

Dates Entered : 30  
Data Quality : EXCELLENT  
Leak Rate : 0.025  
MDL : 0.109  
Threshold : 0.054  
Conclusion : PASS (0.2 gph criteria)

Meet Inventory Control Procedures: Yes  
Cumulative Variance: 271  
Leak check: 144 + 130 = 274



## EVALUATION REPORT

**TotalSIR**  
**P.O. Box 299**  
 Reidsville, NC 27323

**P.O. Box 299 • Reidsville, NC 27323**

Dates Analyzed : 11/16/2023 - 12/15/2023  
 Facility Name : XXXXXXXXXX  
 Address : XXXXXXXXXX  
 Site Directory : 64341  
 Tank Number : 002  
 Tank ID : Premium  
 Tank Type : Steel  
 Diameter (inch) : 96  
 Capacity (gal) : 10,028  
 Total Capacity : 10,028

Date	Delivery	Sales	In-Tank	On-Books	Variance	Cum.
11/16/2023		23.0	2,845.0	2,869.0	-24.0	-24.0
11/17/2023		84.0	2,767.0	2,761.0	6.0	-18.0
11/18/2023		13.0	2,752.0	2,754.0	-2.0	-20.0
11/19/2023		36.0	2,721.0	2,716.0	5.0	-15.0
11/20/2023		9.0	2,706.0	2,712.0	-6.0	-21.0
11/21/2023		89.0	2,629.0	2,617.0	12.0	-9.0
11/22/2023	992.0	63.0	3,658.0	3,558.0	100.0	91.0
11/23/2023		27.0	3,625.0	3,631.0	-6.0	85.0
11/24/2023		52.0	3,577.0	3,573.0	4.0	89.0
11/25/2023		35.0	3,544.0	3,542.0	2.0	91.0
11/26/2023		66.0	3,464.0	3,478.0	-14.0	77.0
11/27/2023		31.0	3,432.0	3,433.0	-1.0	76.0
11/28/2023		59.0	3,383.0	3,373.0	10.0	86.0
11/29/2023		35.0	3,335.0	3,348.0	-13.0	73.0
11/30/2023		55.0	3,271.0	3,280.0	-9.0	64.0
12/1/2023		87.0	3,192.0	3,184.0	8.0	72.0
12/2/2023		56.0	3,128.0	3,136.0	-8.0	64.0
12/3/2023		38.0	3,096.0	3,090.0	6.0	70.0
12/4/2023		30.0	3,065.0	3,066.0	-1.0	69.0
12/5/2023		7.0	3,049.0	3,058.0	-9.0	60.0
12/6/2023		93.0	2,970.0	2,956.0	14.0	74.0
12/7/2023		50.0	2,923.0	2,920.0	3.0	77.0
12/8/2023		82.0	2,830.0	2,841.0	-11.0	66.0
12/9/2023		58.0	2,783.0	2,772.0	11.0	77.0
12/10/2023		35.0	2,752.0	2,748.0	4.0	81.0
12/11/2023			2,752.0	2,752.0	0.0	81.0
12/12/2023		62.0	2,690.0	2,690.0	0.0	81.0
12/13/2023		34.0	2,656.0	2,656.0	3.0	84.0
12/14/2023		53.0	2,613.0	2,606.0	7.0	91.0
12/15/2023		67.0	2,537.0	2,546.0	-9.0	82.0
12/16/2023						
Sum:	992.0	1,429.0				

Dates Entered : 30  
 Data Quality : EXCELLENT  
 Leak Rate : 0.041  
 MDL : 0.167  
 Threshold : 0.083  
 Conclusion : PASS (0.2 gph criteria)

Meet Inventory Control Procedures: Yes  
 Cumulative Variance: 82  
 Leak check: 14 + 130 = 144

**LIMITATIONS / CONDITIONS OF APPROVAL**

- All monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer instructions, and verified every 12 months for operability, proper operating condition, and proper calibration by a certified technician. Records of sampling, testing, or monitoring shall be maintained in accordance with **ATCP 93.500(9)**
- The manufacturer shall submit for a revision to this Wisconsin Material Approval application if any of the functional performance capabilities of this equipment are revised. This would include, but not be limited to changes in software, hardware, or methodology.
- While third-party testing does determine a required minimum tank level, EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. Consistent testing at low levels could allow a leak to remain undetected.
- Before a tank system, which includes all tank(s) and all product piping connected within the system, can be switched to SIR from another leak detection methodology, a third-party approved precision tightness test shall be performed on the portion of the tank system to be monitored by the SIR system.
- Critical performance parameters for the **TotalSIR Version 1.0 Statistical Inventory Reconciliation System** (0.20 gph monthly monitoring):

Parameter	Value
Maximum Tank Size <sup>1</sup>	<b>45,000 gallons</b> (Single Tank) <b>45,000 gallons</b> (Manifolded Tanks)
Maximum No. of Manifolded Tanks	<b>4</b>
Minimum number of days for analysis	<b>23</b>

1: Manifolded tank capacity is an aggregate capacity of all tanks (maximum of four tanks).

- The TotalSIR Version 1.0 Statistical Inventory Reconciliation System may be used as a method of monthly monitoring for tanks and connected piping complying with **ATCP 93.515 (6)**.
- The threshold used in the evaluation shall not exceed one-half the EPA established minimum detectable leak rate of 0.2 gph for monthly monitoring.
- **Mechanical or electronic line leak detectors capable of detecting, at a minimum, a leak rate of 3.0 gph at 10 psi within one hour, shall be installed in the piping system to detect catastrophic failures per ATCP 93.515(8).**
- Tank systems or portions of tank systems using statistical inventory reconciliation as the primary method of leak detection shall be monitored and evaluated for leaks at least every 30 days with a conclusive result of pass or fail within the 30-day monitoring period.
- The statistical inventory reconciliation vendor shall analyze the data and supply an evaluation report to the operator within the 30-day monitoring period.

- If the result of the 30-day monitoring period is inconclusive or missing, another method of leak detection shall be used to determine a conclusive pass or fail for that monitoring period.
- If a second test is required to confirm the status of a tank system, that test shall be an approved tightness test in accordance with **ATCP 93.515(4)**

This approval will be valid through December 31, 2027, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Material Approval Number must be provided when plans that include this product are submitted for review.

### **DISCLAIMER**


The Department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement unless specified in this document.

Effective Date: January 2, 2024

Reviewed by: 

Date: 1/2/2024

Erik Otterson  
Environmental Specialist  
Bureau of Weights and Measures

Approved by: 

Date: 1/2/2024

Greg Bareta, P. E.  
Section Manager  
Bureau of Weights and Measures