

# Measurement of Produced Water for Custody Transfer

API TECHNICAL REPORT 2583  
FIRST EDITION, JUNE 2025



American  
Petroleum  
Institute

Currently in preview, click buy full version

## Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations under local, state, or federal laws.

Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the employer, the manufacturer or supplier of that material, or the material safety data sheet.

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

All rights reserved. No part of this work may be reproduced, translated, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the Publisher, API Publishing Services, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001-5571.

## Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001, [standards@api.org](mailto:standards@api.org).

Currently in preview, click buy full version

Currently in preview, click buy full version

## Contents

	Page
<b>1</b> Scope.....	1
<b>2</b> Normative References.....	1
<b>3</b> Terms and Definitions.....	1
<b>4</b> Selection of Methods for Dynamic Measurement Quantity Determination Using Available Equipment.....	1
<b>4.1</b> Measurement Considerations.....	1
<b>4.2</b> Produced Water Contract Conditions.....	2
<b>5</b> General Metering System Design.....	2
<b>5.1</b> Process Conditions, Fluid Properties, and Flow Assurance Considerations.....	3
<b>5.2</b> Metering System—General Design Considerations.....	3
<b>5.3</b> Metering System—Controls, Diagnostics, and Operator Interface Considerations.....	4
<b>5.4</b> Capability and Uncertainty.....	4
<b>6</b> Design and Selection of Metering System Components.....	5
<b>6.1</b> Flow Meter Technologies.....	5
<b>6.2</b> Flow Meter Sizing.....	7
<b>6.3</b> Piping and Valves for Metering Maintenance and Integrity.....	7
<b>6.4</b> Flow Meter Compatibility with Electrical System.....	7
<b>6.5</b> Strainers and Filters.....	7
<b>6.6</b> Air Eliminators.....	8
<b>6.7</b> Insulation or Heat Tracing.....	8
<b>6.8</b> Thermal Relief Systems.....	8
<b>6.9</b> Vents.....	8
<b>6.10</b> Drains.....	8
<b>6.11</b> Pumps.....	8
<b>7</b> Start-up and Commissioning.....	8
<b>8</b> Record Keeping.....	8
<b>8.1</b> General.....	8
<b>8.2</b> Data Availability.....	9
<b>8.3</b> Audit and Reporting Recommendations.....	9
<b>8.4</b> Security.....	10
<b>9</b> Confirmation of Performance.....	10
<b>9.1</b> Performance Records.....	10
Annex A (informative) Flow Meter Technology Advantages and Limitations.....	11
Bibliography.....	13
<b>Tables</b>	
<b>1</b> Measurement Considerations.....	2
<b>2</b> Typical Meter Types for Produced Water Measurement.....	6

## Contents

	Page
A.1 Flow Meter Technology Advantages and Limitations.....	11

Currently in preview, click buy full version

## Introduction

This technical report (TR) provides users with information available for use in applying metering technology to achieve produced water measurement uncertainties of better than or equal to  $\pm 5.0\%$  of reading unless otherwise agreed to by contractual parties or regulatory agency. It is not intended to serve as a standard or recommended practice and instances where recommendations occur, it is provided for consideration, rather than establishing an industry practice.

Produced water quantity (mass or volume) does not necessarily require temperature or pressure correction to standard conditions. However, temperature and pressure can be measured for alternate purposes (e.g., safety, ancillary information). Note that generally accepted correction tables do not exist for temperature and pressure correction in produced water. Refer to API *MPMS* Chapter 20.1 for more information.

This TR is not intended to cover produced water quality, emulsions, separator/allocation measurement, or temperature and pressure corrections.

Currently in preview, click buy full version

# Measurement of Produced Water for Custody Transfer

## 1 Scope

This technical report provides information available for use in dynamic quantity measurement of produced water. This technical report provides additional considerations for the design, selection, and maintenance of a produced water measurement system for custody transfer applications.

## 2 Normative References

There are no normative references for this document.

## 3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **produced water**

A fluid from oil and natural gas wells that primarily consists of formation water and may include injection water and other naturally occurring and added compounds, solids, and constituents.

### 3.2

#### **flow assurance**

The act of ensuring successful flow of the fluid stream from reservoir to the point of sale.

### 3.3

#### **calibration**

A set of operations which establish, under specified conditions, the relationship between the values indicated by a measuring device and the corresponding known values indicated when using a suitable measuring standard.

### 3.4

#### **verification**

The process or procedure of comparing an instrument to a reference standard to ensure its indication or registration is in satisfactorily close agreement, without making an adjustment.

### 3.5

#### **flow meter diagnostics**

Hardware, software, or firmware internal or external to a flow meter for the purpose of monitoring, analyzing, or identifying functionality, status, or performance of the flow meter.

### 3.6

#### **gross volume**

#### **GV**

The actual volume of fluids at flowing temperature and pressure.

## 4 Selection of Methods for Dynamic Measurement Quantity Determination Using Available Equipment

### 4.1 Measurement Considerations

Selecting the best measurement technology to be used for custody transfer of produced water requires the user to consider the technology best suited for the application and the manufacturer's recommendation for use. [Table 1](#) includes some considerations.