geotech

US D-95 Depth-Integrating Suspended-Sediment Sampler

Installation and Operation Manual

Rev 04/09/2026 Part # 11000012

Table of Contents

DOCUMENTATION CONVENTIONS

This uses the following conventions to present information:

WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.

CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.

NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

Section 1: System Description

Function and Theory

The **US D-95** is a streamlined, 64-pound suspended-sediment sampler designed to collect depth-integrated, flow-weighted samples in medium-velocity streams. The sampler features a delrin body and tail section, making it suitable for water-quality applications.

When submerged with the nozzle pointed into the flow, the water-sediment mixture enters through the nozzle into the collection bottle. Air is simultaneously exhausted through a vent hole in the cap to maintain isokinetic inflow efficiency.

System Components

The US D-95 sampler is a modular system designed for depth-integrated sampling. While the base unit includes the core frame and suspension hardware, several interchangeable components are required to customize the sampler for specific stream conditions and water-quality protocols.

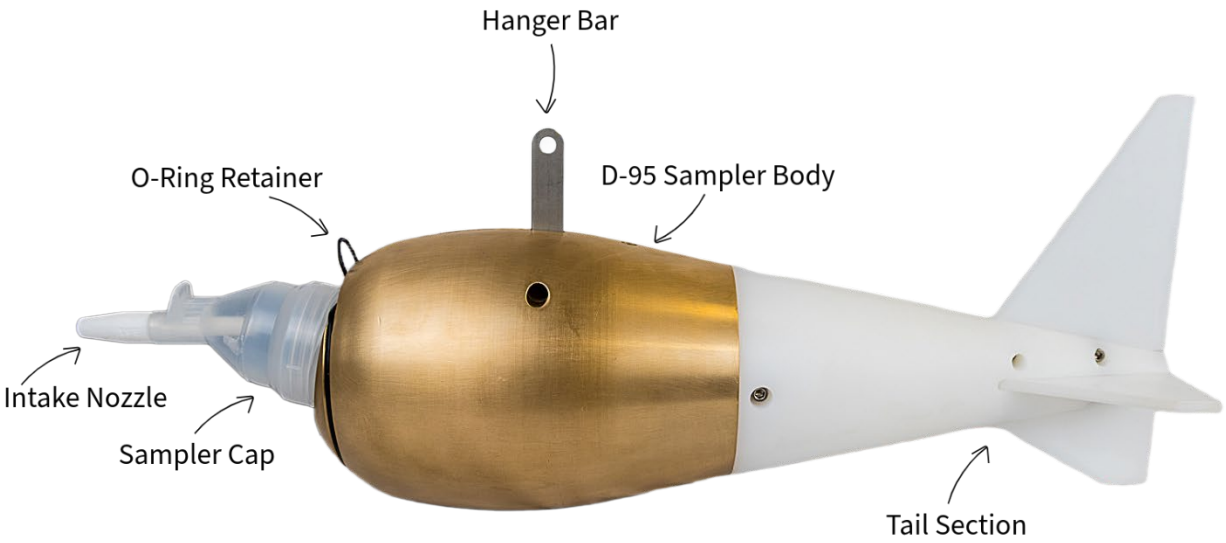

Figure 1

1. Sampler Body: The core of the system is a 64-pound streamlined body cast from low-lead bronze. The entire casting is coated with a delrin to eliminate exposed metal surfaces, making it suitable for trace-element and water-quality sampling without the risk of metal contamination.

2. Tail Section: The tail section is machined from delrin. This component provides the necessary buoyancy and hydrodynamic stability to ensure the sampler aligns horizontally with the stream

flow upon submergence. The plastic construction further ensures a metal-free sampling environment.

3. Hanger Bar and Pin: A stainless steel hanger bar and pin are provided to connect the sampler to a standard suspension system, such as a reel and crane, bridge board, or hand-line. This assembly allows the sampler to pivot, maintaining its orientation relative to the water surface.

4. Sample Container (Bottle)(not pictured) The US D-95 is designed to house a 1-liter (1000 mL) sample container.

    a. Plastic Bottle: For standard suspended-sediment sampling.
    b. FEP Bottle: Required for specialized water-quality sampling where inert materials are necessary.

5. Sampler Cap: The cap secures the nozzle to the bottle and provides an air exhaust port to maintain isokinetic inflow.
    a. US D-95 Cap™: Specifically designed for the D-95 to mate with 1-liter bottles.
    b. US D-77 Cap: An alternative cap configuration compatible with the D-95 body.
    c. PTFE Adapter: Required specifically when mating the US D-77 cap to a 1-liter PTFE bottle.

6. Intake Nozzles: Nozzles are interchangeable to accommodate varying stream velocities (1.5 to 7.5 ft/sec). They are available in both Plastic and PTFE:
    a. 3/16" ID Nozzle: Used for lower velocity/deeper transits.
    b. 1/4" ID Nozzle: The standard size for most medium-velocity applications.
    c. 5/16" ID Nozzle: Used for higher velocity or shorter transit times.

7. O-Ring Retainer: A heavy-duty O-ring are used to lock the bottle and cap assembly into the sampler’s internal cavity. This ensures the container remains stationary during high-velocity deployments and prevents accidental loss of the sample.

8. Carrying Case: (not pictured) A fitted case is included for the safe transport and storage of the 64-pound sampler and its primary hardware, protecting the plastic coating and tail section from impact damage.

Section 2: System Installation

- **Suspension Setup:** Connect the sampler to a hanger bar, then attach the hanger bar to a suspension cable.

- **Nozzle Selection:** Select the largest diameter nozzle allowed by the transit rate and stream depth.
- **Cap Assembly:** Screw the selected nozzle into a clean US D-77 or US D-95 cap. Ensure it is seated fully but only hand-tight.
- **Bottle Insertion:** Lift the o-ring in the sampler cavity and slide the bottle-cap configuration into place.
- **Securing:** Fit the o-ring over the neck of the bottle to hold it securely.
- **Alignment:** Rotate the bottle until the cap's air vent hole is in the vertical (upward) position.

CAUTION Never use a wrench to tighten a nozzle. If threads are obstructed, clean them with a tap before assembly.

Section 3: System Operation

Sampling Process

NOTE

The US D-95 will not hang horizontal in the air; the tail section will naturally sit lower. Buoyancy will align the sampler to horizontal once it is submerged.

1. **Lowering:** Lower the sampler to the water surface. Allow the tail to contact the water first to align the nozzle with the flow.
2. **Deployment:** Using a constant transit rate, smoothly lower the sampler into the flow.
3. **Bed Contact:** When the streambed is touched, immediately reverse direction.
4. **Retrieval:** Raise the sampler back to the surface using the same constant transit rate.

WARNING

Avoid hitting the streambed forcefully. This can stir up loose sediment and bias the sample concentration.

Post-Sampling and Labeling

Label each bottle with the following essential information:

- Stream Name and Location
- Date and Time of Day
- Gage Height
- Vertical Location and Depth
- Sampling Duration
- Water Temperature
- Operator Name

Guidance Resources & Methods Summary

For detailed sampling instructions, please refer to the following

Edwards, T.K., and Glysson, G.D., 1999, Field Methods for Measurement of Fluvial Sediment: U.S. Geological Survey Techniques of Water Resources Investigations, book 3 chapter C2, 89 p.

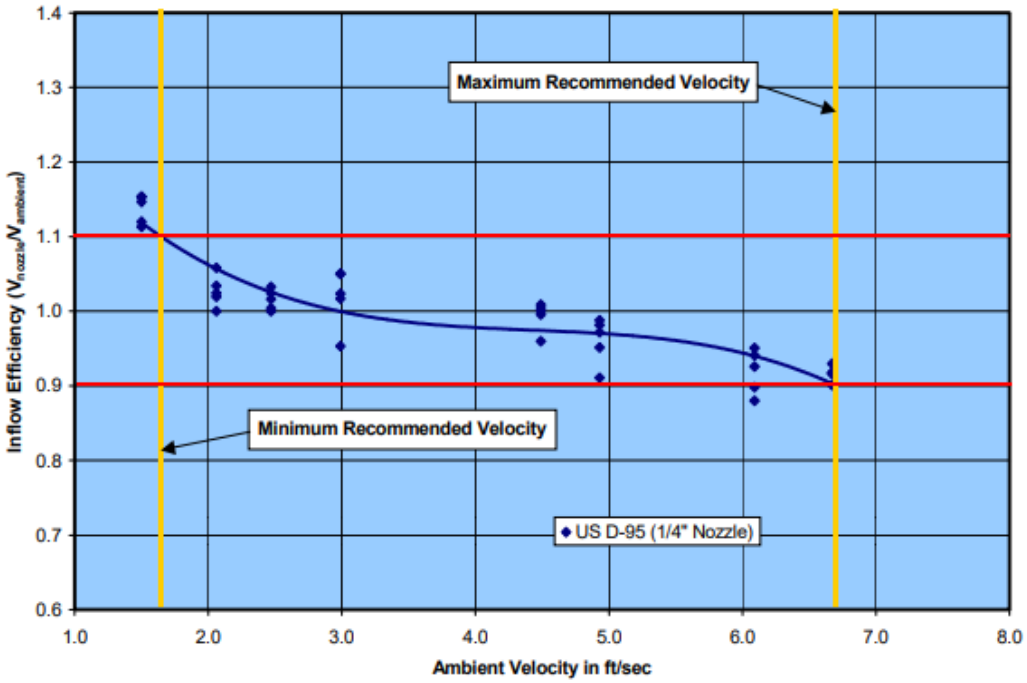

Figure 2: Inflow efficiency, US D-95, ¼-inch Nozzle

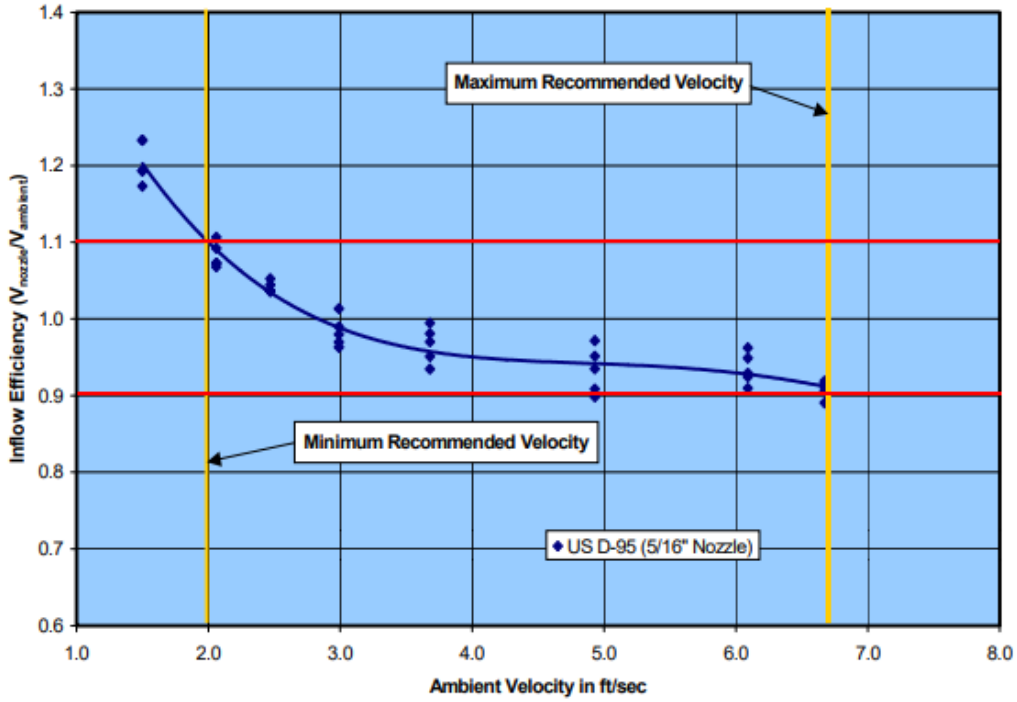

Figure 3: Inflow Efficiency, US D-95, 5/16-inch Nozzle

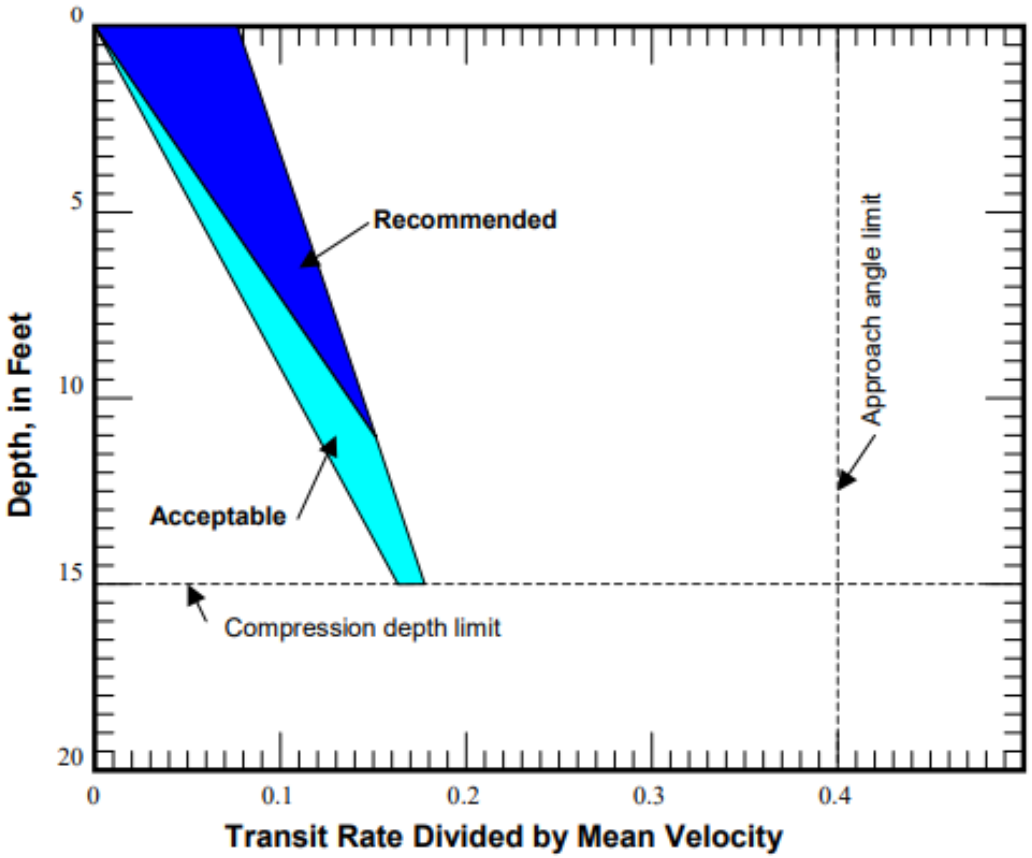

Figure 4: Transit Rate Diagram for US D-95, 3/16-inch Plastic Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

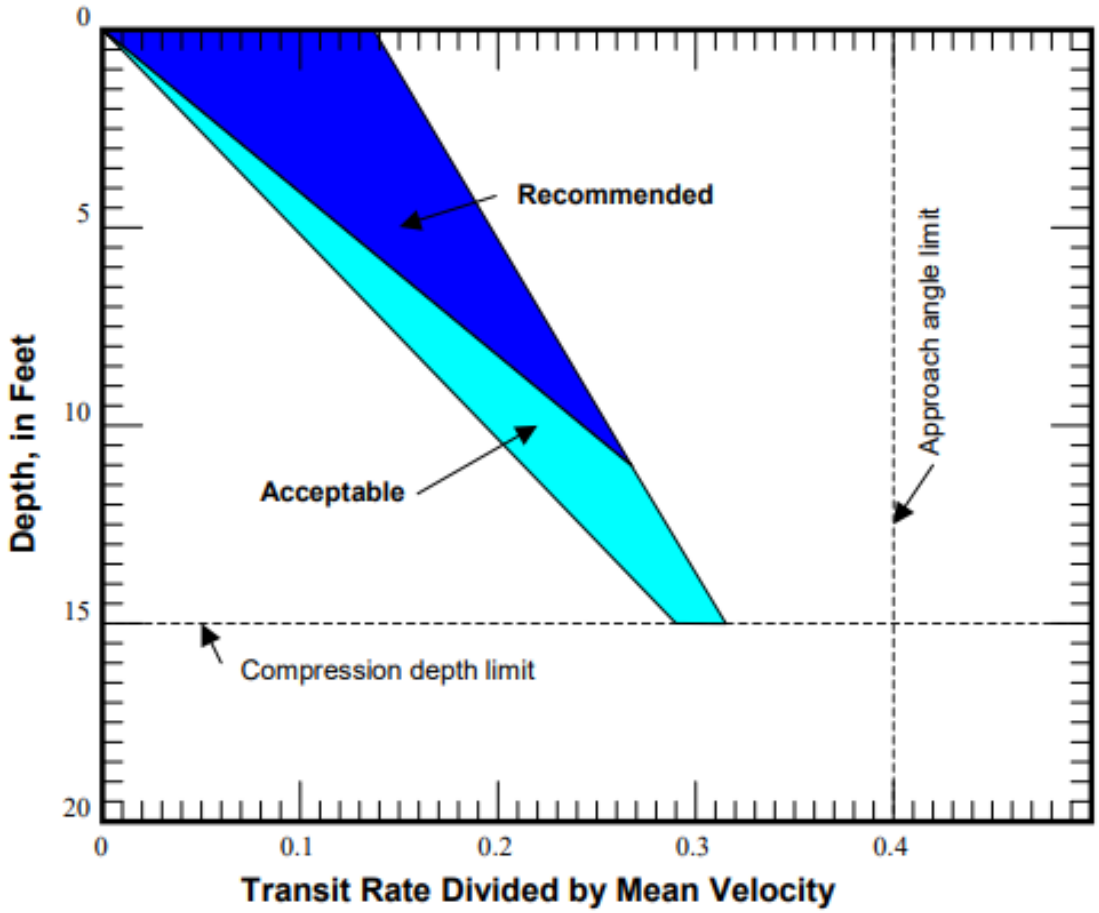

Figure 5: Transit Rate Diagram for US D-95, 1/4-inch Plastic Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

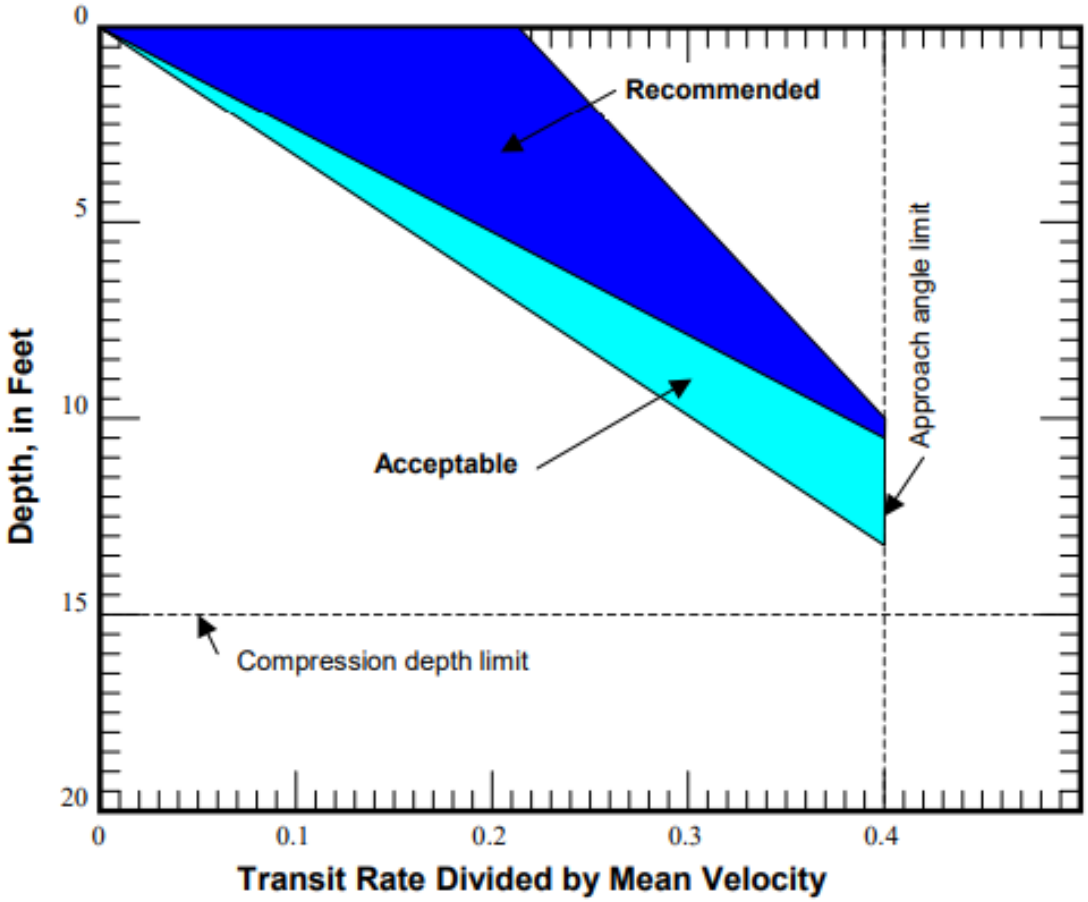

Figure 6: Transit Rate Diagram for US D-95, 5/16-inch Plastic Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

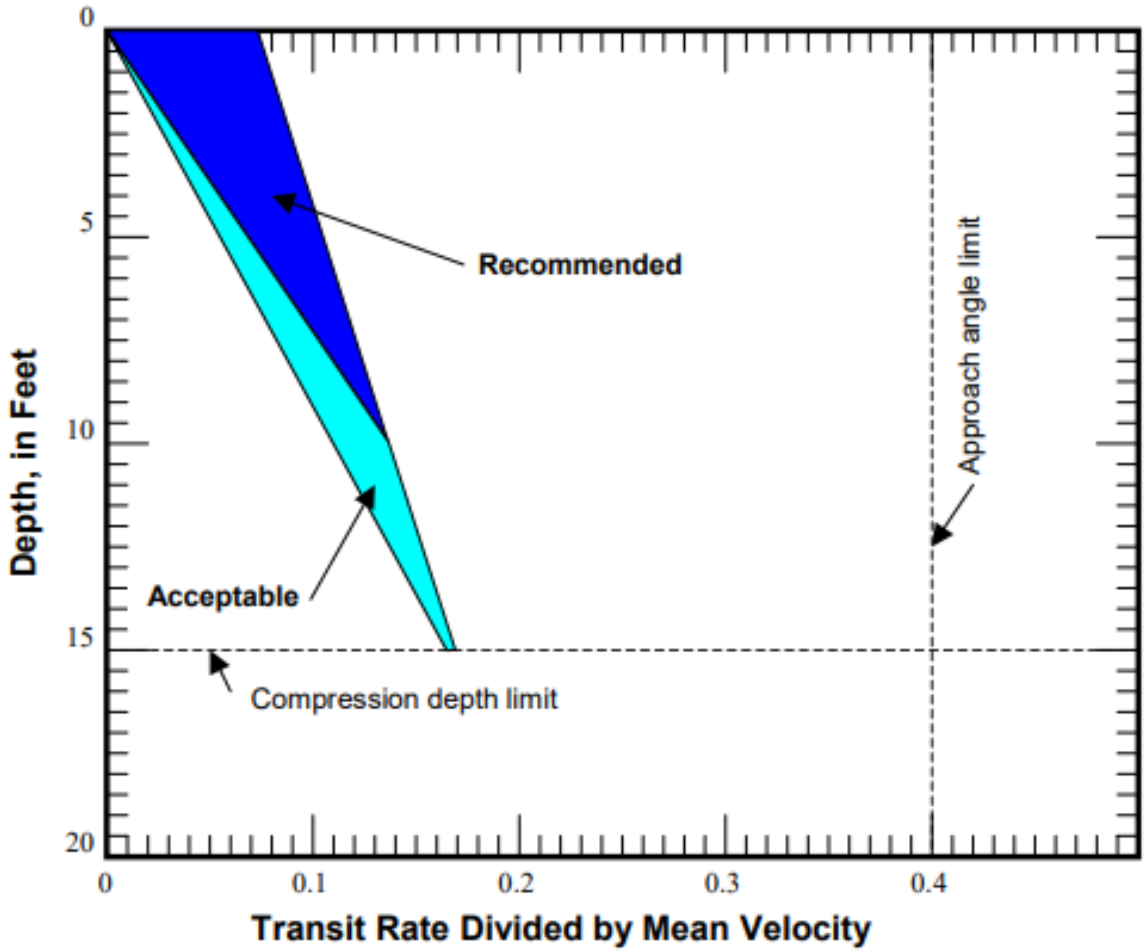

Figure 7: Transit Rate Diagram for US D-95, 3/16-inch PTFE Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

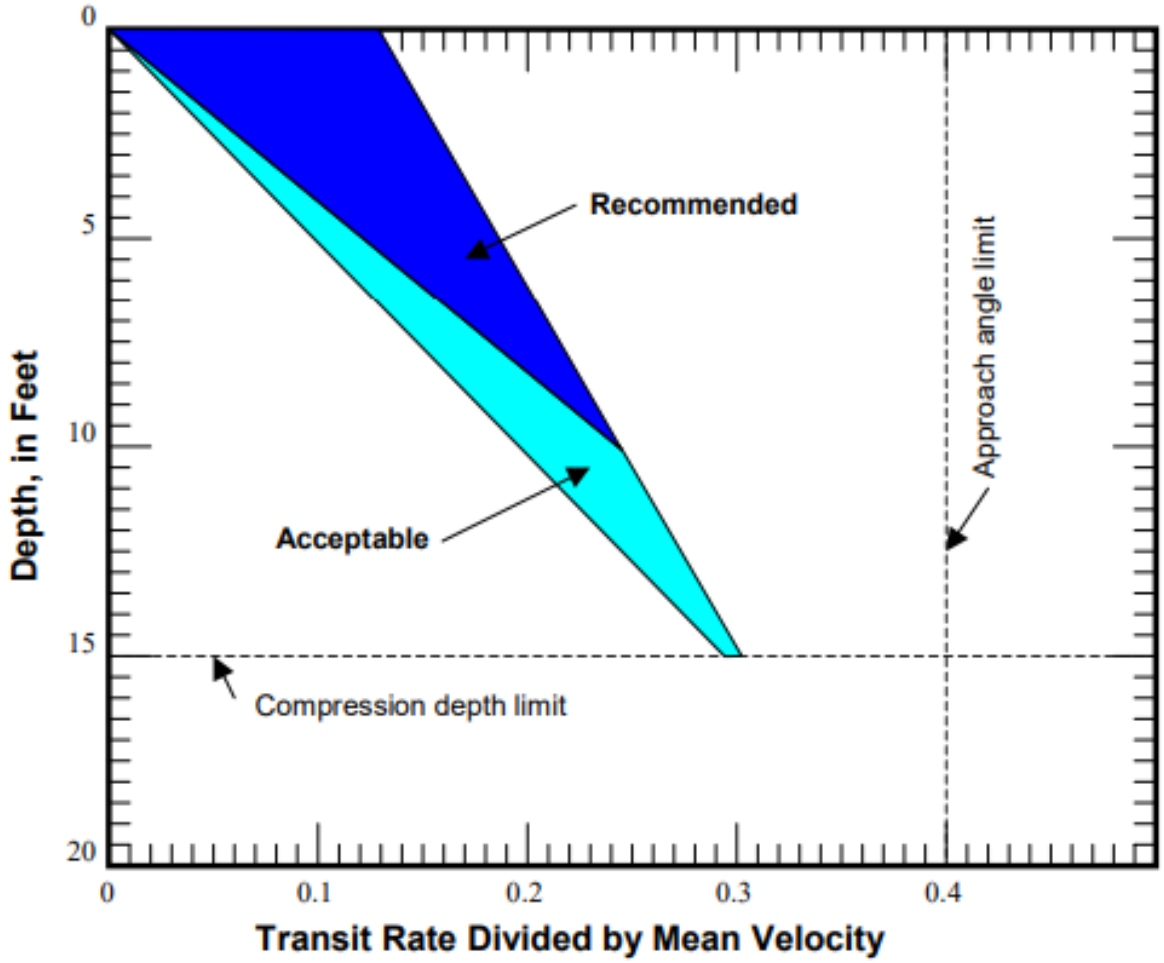

Figure 8: Transit Rate Diagram for US D-95, ¼-inch PTFE Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

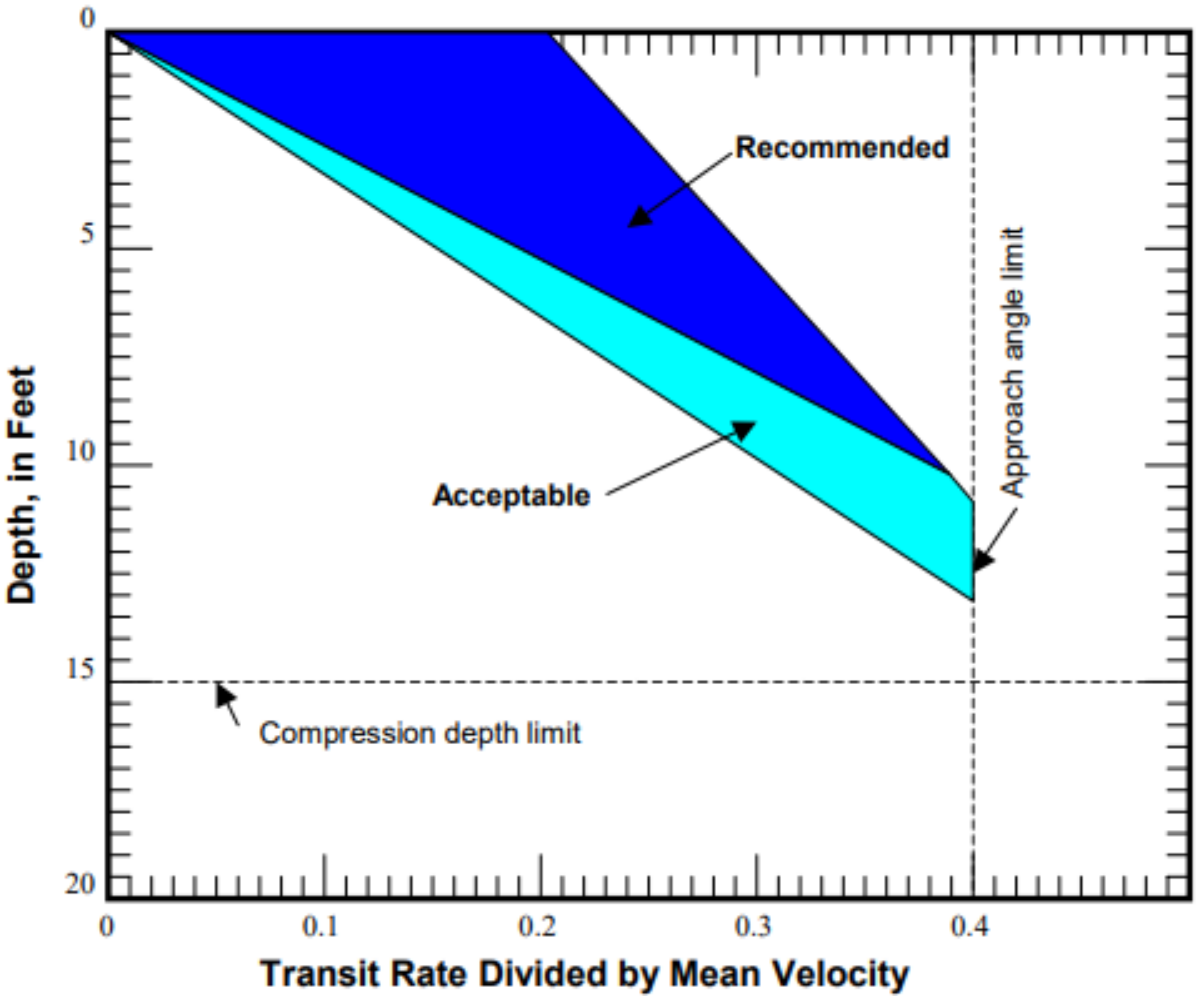

Figure 9: Transit Rate Diagram for US D-95, 5/16-inch PTFE Nozzle

NOTE

The following configuration and volumes were used to produce this diagram. The total volume of the sampler container is 1215 mL, which includes a polypropylene bottle and US D-77 cap. The maximum recommended sample volume is 800 mL. The maximum acceptable sample volume is 1000 mL.

Section 4: System Maintenance

Body Coating Repair

The protective Delrin coating is essential for water-quality sampling. If the coating is chipped or worn, it can be repaired using commercially available "PlastiDip".

Nozzles and Caps

- **Inspection:** Periodically check nozzle threads for debris or damage.
- **Cleaning:** Use a 9/16-18 NF threading tap to clean cap threads if they become difficult to turn.
- **O-Ring:** Inspect the o-ring for cracks or loss of elasticity; replace if the bottle is not held firmly.

Section 5: System Troubleshooting

Isokinetic Inflow Issues: If inflow efficiency falls outside the 90%–110% range, verify that the air vent hole is not obstructed and the nozzle is pointed directly into the flow.

Getting Help

Geotech service personnel are trained on all aspects of the US DH-81 equipment line and are dedicated to helping you maximize the efficiency and cost effectiveness of your US DH-81 system. For further technical support, replacement parts, or custom sampler configurations, contact Geotech Sales.

Geotech Environmental Equipment, Inc.
2650 E 40th Ave, Denver, CO 80205
Phone: 1-800-833-7958
Email: sales@geotechenv.com
Website: www.geotechenv.com

Section 6: System Specifications

TABLE 1. Filling Times for the US D-95 Sampler

		3/16-inch Nozzle	1/4-inch Nozzle	5/16-inch Nozzle
Velocity in ft/sec	Volume in mL	Time in seconds	Time in seconds	Time in seconds
1.4	800	105	59	38
1.6	800	92	52	33
1.8	800	82	46	29
2.0	800	74	41	27
2.2	800	67	38	24
2.4	800	61	35	22
2.6	800	57	32	20
2.8	800	53	30	19
3.0	800	49	28	18
3.2	800	46	26	17
3.4	800	43	24	16
3.6	800	41	23	15
3.8	800	39	22	14
4.0	800	37	21	13
4.2	800	35	20	13
4.4	800	33	19	12
4.6	800	32	18	12
4.8	800	31	17	11
5.0	800	29	17	11
5.2	800	28	16	10
5.4	800	27	15	10
5.6	800	26	15	9
5.8	800	25	14	9
6.0	800	25	14	9
6.2	800	24	13	9
6.4	800	23	13	8
6.6	800	22	13	8
6.8	800	22	12	8
7.0	800	21	12	8
7.2	800	20	12	7
7.4	800	20	11	7
7.6	800	19	11	7

RECOMMENDED VELOCITY RANGE

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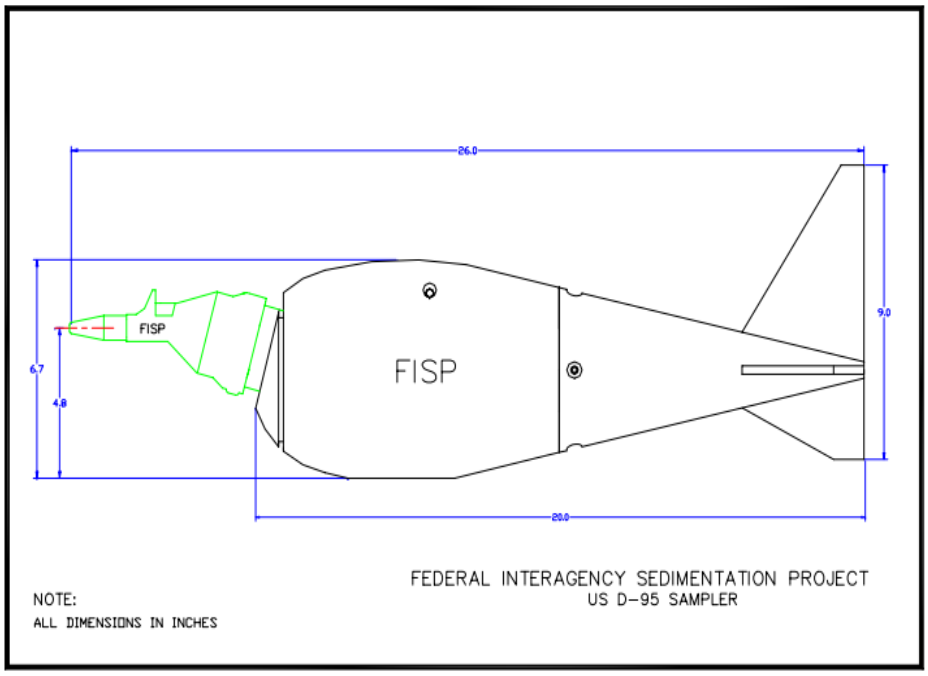
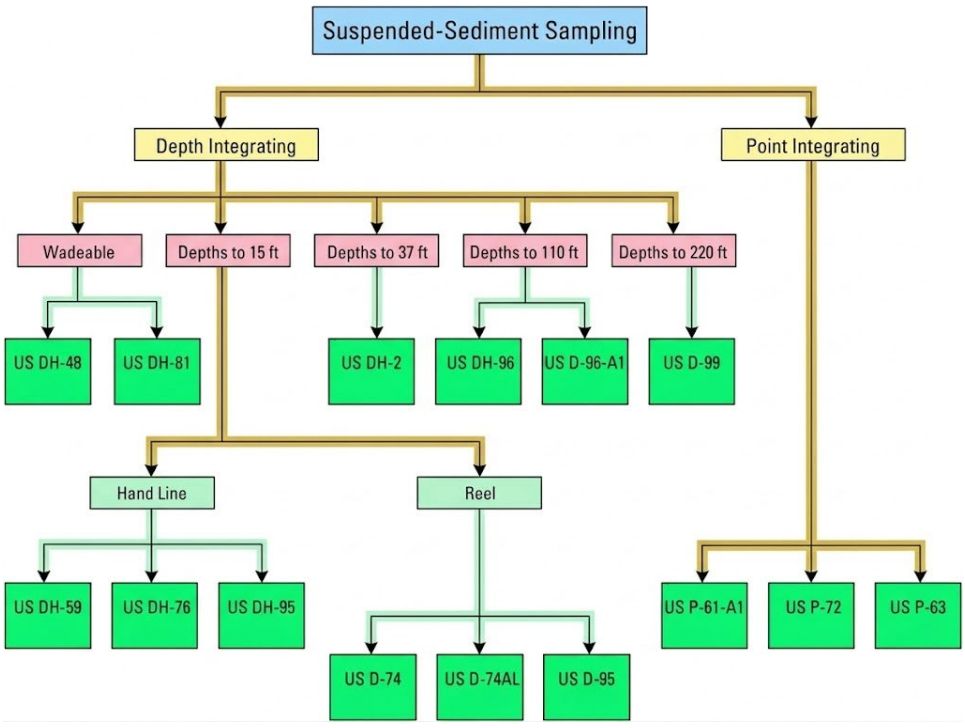
Technical Specification			
Nozzle	3/16”	¼"	5/16”
Velocity Range	2.0 to 6.2 ft/sec	1.5 to 7.5 ft/sec	2.0 to 7.0 ft/sec
Total Length	26 in (66 cm) with bottle and nozzle attached		
Nozzle Material	Delrin or PTFE		
Body Material	coated bronze body and tail section		
Weight	64 lbs (29 kg)		
Max Recommended Sample Depth	15 ft at Sea Level		
Unsampled Zone	<4.8 in (12.2 cm)		
Hanger Bar and Pin			
Material	Stainless Steel		
Bottles			
Nominal Volume	1 Liter		
Suggested Sample Volume	800ml		
Length	20.0” (50.8cm)		
Diameter	6.7” (17.02cm)		
Materials	HDPE or PTFE		

Section 7: System Schematics





Section 8: Parts and Accessories

D-95 SAMPLER		
71000058	SAMPLER,SEDIMENT,D-95,WITH CASE/HANGER	4101015, HIFF
D-95 PARTS		
57500011	HOLDER CAP,NOZZLE,POLY,D77/DH81/D95/DH95	4107034, HIFF
71000028	NOZZLE,DELRIN,3/16",D77/DH81/D95/DH95	4107084,HIF,WHITE,2.0-6.2FT/SE
71000029	NOZZLE,DELRIN,1/4",D77/DH81/D95/DH95	4107085,HIF,WHITE,1.5-7.6FT/SE
71000030	NOZZLE,DELRIN,5/16",D77/DH81/D95/DH95	4107086,HIF,WHITE,2.0-7.0FT/SE
71000003	HDPE,SINGLE BOTTLE,1 LITER,D77,DH81	4107020, HIFF
71000002	HOLDER CAP,NOZZLE,PTFE,D95/DH81	4107036, HIFF
71000032	NOZZLE,PTFE,3/16",D77/DH81/D95/DH95	4107087,HIF,2.0-6.2FT/SEC
71000031	NOZZLE,PTFE,1/4",D77/DH81/D95/DH95	4107088,HIF,1.5-7.6FT/SEC
71000020	NOZZLE,PTFE,5/16",D77/DH81/D95/DH95	4107089,2.0-7.0FT/SEC
71000007	BOTTLE,FEP,1 LITER,D95/DH81	4107021,HIF
	LID, PTFE FOR 1-LITER BOTTLE	4107037, HIFF
71000069	O-RING RETAINER FOR BOTTLE DH-95,D95	4107109, HIFF
71000039	HANGER,BAR & PIN,D74/DH2/D95/DH95/D96	4107055, HIFF
71000070	TAIL SECTION (D-95)	4107114, HIFF

Revision History		
Project #	**Description**	**Date**
M2550	**Manual Created – AL AH BF**	**4/10/26**

NOTES

NOTES

The Warranty

For a period of one (1) year from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

Equipment Return Policy

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call our 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

FOR A RETURN MATERIAL AUTHORIZATION, PLEASE CALL OUR SERVICE DEPARTMENT AT 1-800-833-7958.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Equipment Decontamination

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used. Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate the equipment for a fee, which will be applied to the repair order invoice.

Geotech Environmental Equipment, Inc.
2650 East 40th Avenue Denver, Colorado 80205
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email: sales@geotechenv.com website: www.geotechenv.com