

External Fluid Properties Built-In Fluid Properties

Run

Run Multiple Cases

Technical User Manual

Training Material

Background is dev/nav container.

Inputs/Process Conditions		
Parameter	Units	Value
Geometry		Long Radius Ell <input type="text"/>
r/D		5 <input type="text"/>
Material Type		13Cr Heat Treat <input type="text"/>
Brinell Hardness		160 <input type="text"/>
Pipe Diameter	Inches <input type="text"/>	5.76 <input type="text"/>
Sand Particle Size		<input type="text"/>
Particle Density		<input type="text"/>
Sand Particle Rate		<input type="text"/>
Water Density	lb/ft3 <input type="text"/>	60 <input type="text"/>
Water Viscosity	cp <input type="text"/>	1 <input type="text"/>
Water Rate	ft/s <input type="text"/>	0.0323 <input type="text"/>
Oil Density	lb/ft3 <input type="text"/>	50 <input type="text"/>
Oil Viscosity	cp <input type="text"/>	0.575 <input type="text"/>
Oil Rate	ft/s <input type="text"/>	0.1078 <input type="text"/>
Gas Density	lb/ft3 <input type="text"/>	3.2 <input type="text"/>
Gas Viscosity	cp <input type="text"/>	0.0128 <input type="text"/>
Gas Rate	ft/s <input type="text"/>	52.5 <input type="text"/>
Flow Regime	Churn/Slug <input type="text"/>	<input type="text"/>

Outputs		
Parameter	Value	Unit
Penetration Rate	28.75	mpy
	0.73	mm/yr

SAMPLE SCREEN SHOT

Voice Over Script

(Add voice text here)

In this lesson you will learn:

- How to use sand particle size distribution **instead of** average sand particle size to **better estimate** the erosion rate in the Multi-Case sheet.
- How to use the Multi-Case sheet functionality to copy and paste data, and;
- How to calculate the **total erosion rate** from the resultant model output.

Click Next to begin.

Actions/Interactions

(Add notes for any actions or movements or highlighting here.)

Images

(Add names of image files used here.)

Voice Over Script

Using the Multi-Case sheet, we can predict the erosion rate by **combining** the erosion prediction for multiple cases, **each** representing a sand size range.

BP Erosion Model – Version 2 Workbook Vers 3.0.0.0 Web Service Vers 3.0.0.0 RoleName: User										
Confidential Status: Connected to BP Erosion Model – Version 2 Web Service.										
Calculations Completed	Case Number	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
ReCalculate All	User Notes:	Testing Sample 1	Testing Sample 2	Testing Sample 3	Testing Sample 4	Testing Sample 5	Testing Sample 6	Testing Sample 7	Testing Sample 8	Testing Sample 9
Process Conditions										
Geometry Type		Elbow	Elbow	Long Radius Elbow	Straight Pipe					
r/D(Long Radius Elbow)				1.5						
Material Type		Carbon Steel/Other	13Cr Annealed	Carbon Steel/Other	Carbon Steel/Other					
Brinell Hardness		160	160	160	160	160	160	160	160	160
Pipe Diameter	Inches	5.76	5.76	5.76	8					
Sand Particle Size	microns	150	160	160	160					
Particle density	kg/m3	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sand Particle Rate	lb/day	75	125	150	165					
Water Density	lb/ft3	56.5	56.5	56.5	56.5					
Water Viscosity	cp	0.8	0.8	0.8	0.8					
Water Rate	ft/s	1.5	1.7	2	2					
Oil Density	lb/ft3	53.6	53.6	53.6	53.6					
Oil Viscosity	cp	2.5	3	3	3					
Oil Rate	ft/s	2.2	2.5	2.75	3.2					
Gas Density	lb/ft3	3.35	3.35	3.35	3.35					
Gas Viscosity	cp	0.011	0.015	0.015	0.015					
Gas Rate	ft/s	5	7	9	10.5					
Flow Regime		Churn/Slug	Churn/Slug	Churn/Slug	Annular					
Outputs										
Penetration Rate	mpy mm/yr									
Warnings										

Also add any text that should appear on the screen.

Actions

Highlight the Sand Particle Size row as it is mentioned in the voice.

Images

Image is PSD1.png