



RIFT TD TUTORIAL

DOWNSTREAM DEPOSITION

INTRODUCTION

In this tutorial you will develop a downstream deposition model, with deposition behind an embankment. Deposition Vectors move up the embankment upstream faces as the facility develops.

A copy of the **Rift TD** Users Manual may be useful when working through this tutorial. It is installed during **Rift TD** installation, but can also be downloaded from our [download page](#).

TUTORIAL COMPONENTS

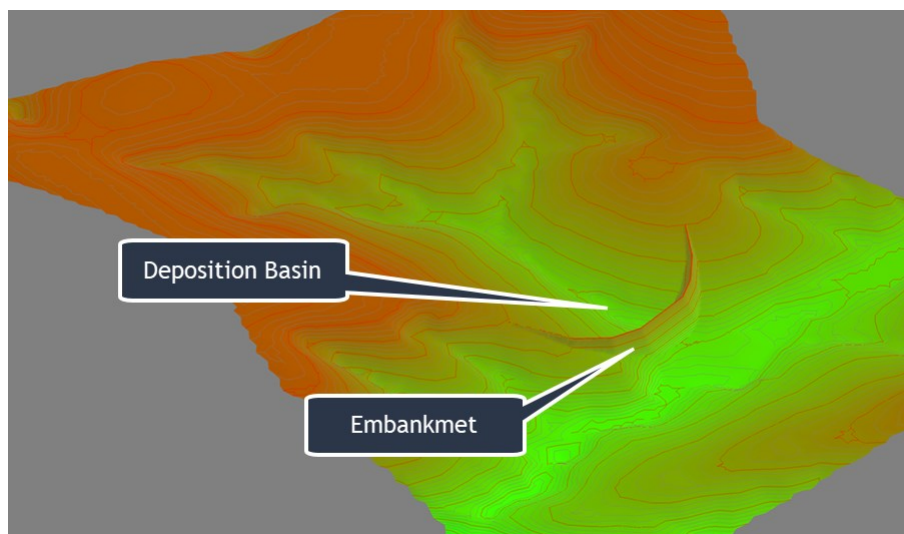
This tutorial comprises:

- This instruction set.
- **Rift TD** files:
 - Base Model.rft: The base model used to develop the deposition surface.
 - Final Model.rft: The final deposition model.
 - Final Model.res: The deposition model result file.
- Text Files (ASCII data files):
 - Survey Data.txt: The ASCII data file used to generate the base topography.
 - Deposition Boundary.txt: Deposition boundary coordinates.

BASE TOPOGRAPHY

This tutorial provides the **Rift TD data file, Base Model.rft**, as a starting point:

- **Click File > Open.**
- **Select Base Model.rft.**
- **Click Open.**



The model comprises an embankment with an upstream deposition basin.

MODEL DEFINITION

A deposition model comprises:

- Raise Elevations:
- A Vector Slope.
- Beach Profiles.
- Material parameters.
- A Supernatant Pond.
- A Deposition Line.

RAISE ELEVATIONS

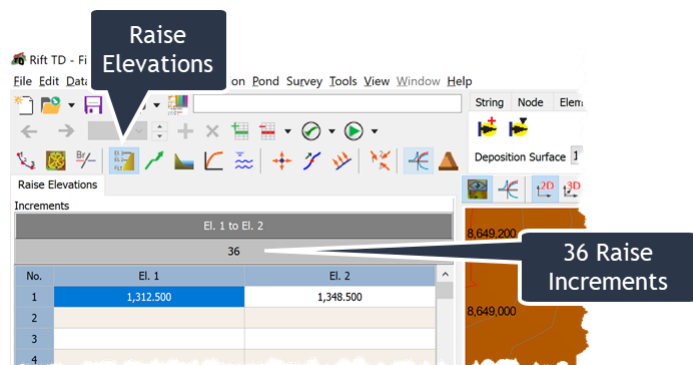
Raise Elevations define the elevations that deposition vectors will be **raised to**, and the **raise increment**.

In this tutorial you will raise deposition vectors from their initial elevation of

- 1312.5 m; to an elevation of
- 1348.5 m; in
- 36 raises i.e. 1.0 m raise increments.

To **set** the **Raise Elevations**.

- **Activate Raise Elevations:**
 - **Click Edit > Raise Elevations;** or
 - **Click** the **Raise Elevation Tool-button**.
- **Enter 36 Raise Increments** on the **Raise Increment Grid**.
- On the **Data Grid**:
 - **Enter** an **initial elevation, El. 1**, of **1312.5 m**.
 - **Enter** a **final elevation, El. 2**, of **1348.5 m**.



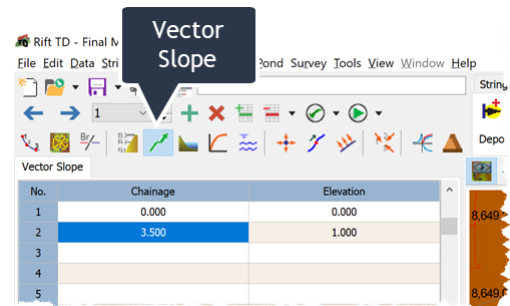
VECTOR SLOPE

A **Vector Slope** defines how deposition vectors move horizontally as they are raised vertically.

In this tutorial you will specify a **Vector Slope** of **1 Vertical in 3.5 Horizontal**.

To **define** the **Vector Slope**:

- **Activate Vector Slopes:**
 - Click **Edit > Vector Slope**; or
 - Click the **Vector Slope Tool-button**.
- **Enter** the **Vector Slope** on the **Data Grid**:
 - Row 1:
 - Chainage: 0.00.
 - Elevation: 0.00.
 - Row 2:
 - Chainage: 3.50.
 - Elevation: 1.00.



BEACH PROFILE

Beach Profiles define a **longitudinal section** along a **beach**.

A typical model has two beach profiles:

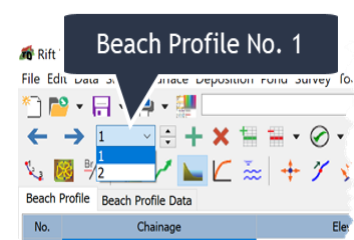
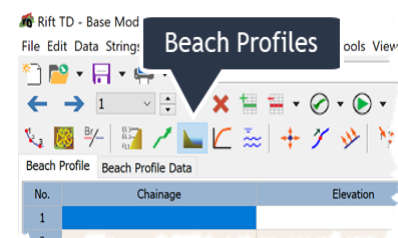
- **Sub-aerial profile**: The beach profile above the supernatant pond.
- **Sub-aqueous profile**: The beach profile below the supernatant pond.

You will define both profiles as linear profiles with a:

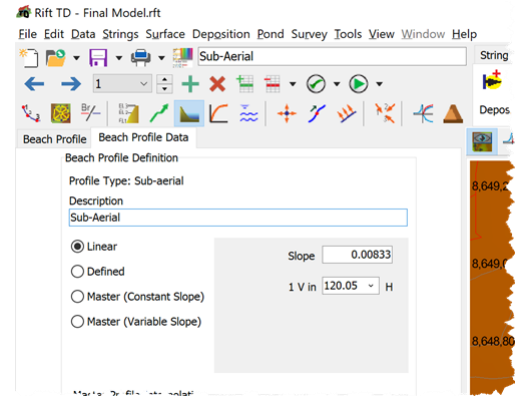
- Sub-aerial slope of 1V:120H.
- Sub-aqueous slope of 1V:40H.

To **define** the **Beach Profiles**:

- Either:
 - Click **Edit > Beach Profiles**; or
 - Click the **Beach Profiles Tool-button**.
- If not active, use the **Navigation toolbar** to **activate Beach Profile No. 1**.



- Click on the **Beach Profile Data Sheet**.
- Enter a **description** of “**Sub-Aerial**”.
- Set the **profile type** to **linear**.
- Enter a **beach slope** of **1V in 120H**.
- Use the **Navigation Toolbar** to **activate Beach Profile No. 2**:
 - Enter a **description** of “**Sub-Aqueous**”.
 - Set the **profile type** to **linear**.
 - Enter a **beach slope** of **1V in 40H**.



MATERIAL

Materials define:

- The **Deposition Rate** over time [mass per day].
- The **Complex Beach Profile** comprising a:
 - Sub-aerial profile, a
 - Sub-aqueous profile, and if necessary, a
 - Cyclone profile.
- **Material densities**.

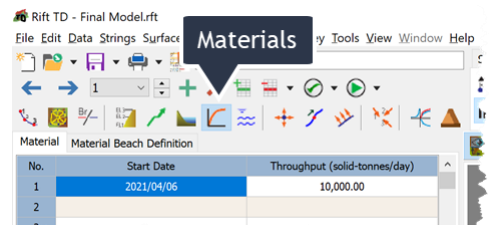
Cyclone Profiles are used to model beach cyclone deposition and are not required for this model.

In this tutorial you will **define**:

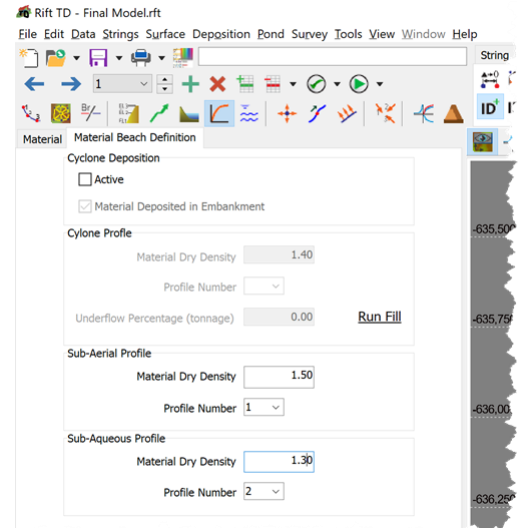
- A **throughput** of **10,000 tonnes per day**.
- Use the two previously defined **Beach Profiles** to **define** the **complex beach profile**.
- **Sub-aerial** and **sub-aqueous densities** of **1.5** and **1.3 tonnes/m³** respectively.

To **define** the **Material**:

- **Activate Materials**:
 - Click **Edit > Materials**; or
 - Click the **Material Tool-button**.
- On the **Data Grid** enter:
 - A **start date** of **6 April 2021**.
 - A **throughput** of **10,000 tonnes per day**.



- Click the **Material Beach Definition Sheet**.
- **Uncheck** Cyclone Deposition Active.
- **Uncheck** Material Deposited in Embankment.
- **Set** a sub-aerial density of 1.5 tonnes/m³.
- **Use** the **Sub-aerial Profile Drop Down Box** to **set** the **Sub-aerial Beach Profile** to **Beach Profile No. 1**.
- **Enter** a sub-aqueous density of 1.3 tons/m³.
- **Use** the **Sub-aqueous Profile Drop Down Box** to **set** the **Sub-aqueous Beach Profile** to **Beach Profile No 2**.

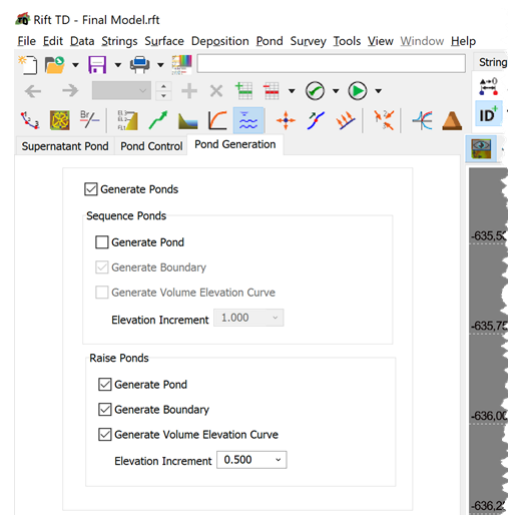
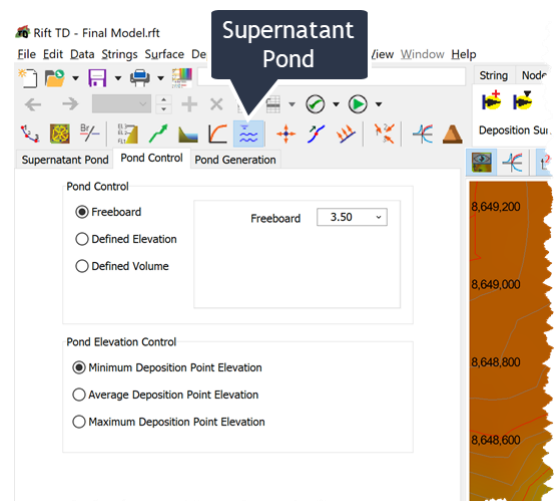


SUPERNATANT POND

The **Supernatant Pond** defines the interface between the sub-aerial and sub-aqueous beaches. In this tutorial you set a **defined Freeboard** of 3.5 m relative to the **Minimum Deposition Point Elevation**.

To **define** the **Supernatant Pond**:

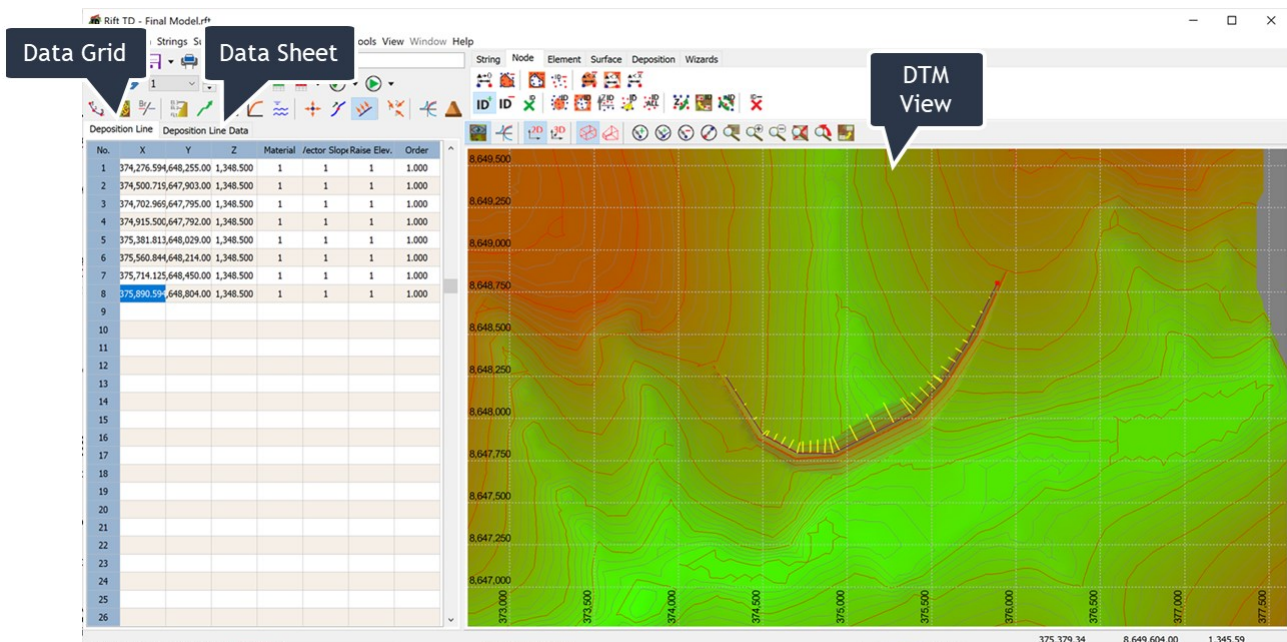
- **Activate** the **Supernatant Pond**:
 - Click **Edit > Supernatant Pond**; or
 - Click the **Supernatant Pond Tool-button**.
- **Select** the **Pond Control Data-sheet**.
 - **Set** the **Pond Control** to **Freeboard**.
 - **Enter** a **Freeboard** of 3.5 m.
 - **Set** the **Pond Elevation Control** to **Minimum Deposition Point Elevation**.
- **Select** the **Pond Generation Data-sheet**:
 - **Check** **Generate Ponds**.
 - **Sequence Ponds**:
 - **Uncheck** **Generate Ponds**.
 - **Raise Ponds**:
 - **Check** **Generate Raise Ponds**.
 - **Check** **Generate Raise Pond Boundary**.
 - **Check** **Generate Volume Elevation Curve**.
 - **Enter** an **elevation increment** of 0.5 m.



DEPOSITION LINE

Deposition Lines generate **Deposition Vectors** from which deposition takes place. **Deposition Lines** have the following parameters:

- On the **Data Grid**:
 - Coordinates.
 - Materials.
 - Raise Elevations.
 - Vector Slopes.
- On the **Deposition Line Data Sheet**:
 - Deposition Direction.
 - Vector Direction.



- Vector Spacing.

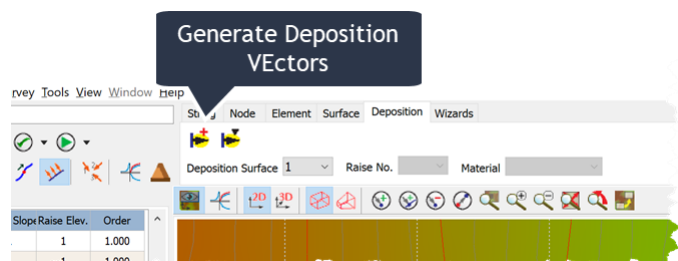
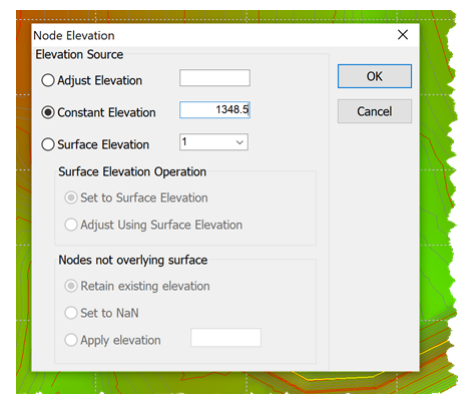
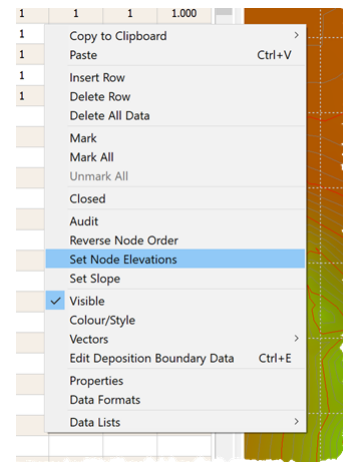
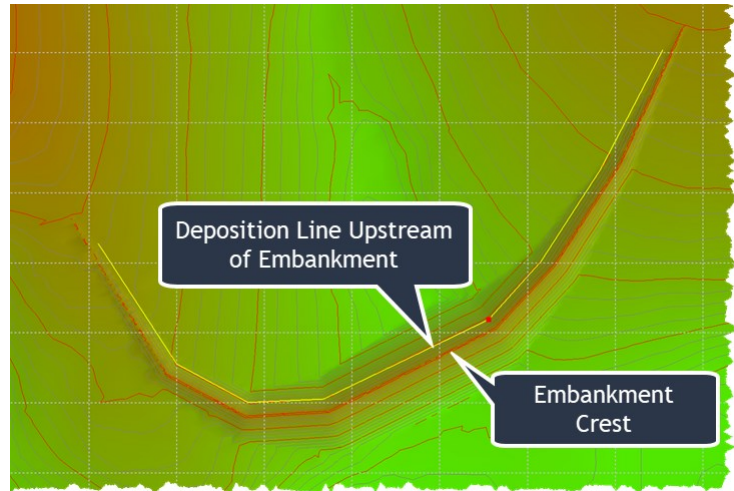
To **define** the **Deposition Line**:

- **Activate Deposition Line**:
 - Click **Edit > Deposition Lines**, or
 - Click **Deposition Line Tool-button**.
- **Define** the **Deposition Line** visually on the **DTM View**:
 - Click **Data > Edit in View > Add**; or
 - Click the **View Add Tool-button**; or
 - **Right click** on the **DTM View** and **click Data > Add**.

You can import coordinates. This tutorial includes an **ASCII file**, **Deposition Line.txt**, that has the **Deposition Line** definition.

Click **File > Import > ASCII** to **import** the data.

- Click on the **DTM View**, upstream of the embankment, to **define** the **Deposition Line Coordinates**.
- **Deactivate DTM View Add Data**:
 - Press **Escape**; or
 - Click **Data > Edit in View > Add**; or
 - Click the **View Add Tool-button**; or
 - **Right click** on the **DTM View** and click **Data > Add**.
- On the **Data Grid**:
 - **Set** the **Deposition Line Node elevations** to the final **deposition elevation** of **1348.5**:
 - **Right click** on the **Data Grid**.
 - Click **Set Node Elevations**.
 - Enter a **Constant Elevation** of **1348.5 m**.
 - Click **Ok**.
 - Enter the **indices** for the previously defined:
 - **Material No. 1**.
 - **Vector Slope No. 1**.
 - **Raise Elevation No. 1**.
 - Enter a **Deposition Order** of **1**.
 - Click the **Deposition Line Data-sheet**.
 - On the **Deposition Line Data Sheet**:
 - **Set** the **Deposition Line** to **Active**.
 - **Uncheck** **Boundary Closed**.
 - **Set** the **Deposition Direction** to **360 Degrees**.
 - **Set** the **Vector Direction** to **Right of Line**.
 - **Set** a **Fixed Vector Spacing** of **50 m**.
 - **Generate** the **Deposition Vectors**:
 - Click **Deposition > Deposition Vector > Generate All Vectors**; or
 - Click the **Generate Deposition Vector Tool-button**.



MODEL RUN

To **run** the **deposition model**:

- Either:
 - **Click Run > Run Model**; or
 - **Click the Run Tool-button**.
- If the result file already exists:
 - You are **prompted** for a **Result File Name**. **Click Ok** to retain the existing file.
 - **Select Overwrite File** on the **Set Result File Task Dialog**.

After the model run **Deposition Results** are **shown** on the **Data Grid** and the **Result View**. A **tutorial** on **Deposition Result Output** is available at riftxone.com.

