Bottom Hole Temperature of the formation

Student Name: Albert Lamy Christian **UID: 19BPE1026**
Branch: Petroleum **Section/Group: 02**
Semester: 05 **Date of Performance:**
Subject Name: Formation evaluation lab **Subject Code: PEP-318**

1. Aim/Overview of the practical:

Calculation of the bottom hole temperature of a given formation.

2. Task to be done:

To calculate bottom hole temperature (BHT) of the formation.

3. Apparatus:

- Well logging data
- Code editor or IDE

4. Algorithm/Flowchart:

- Develop a script, with relevant inputs, for designing the relevant formulation.
- Execute the program and display in the console.

5. Theme/Interests definition:

Bottom hole temperature: is the temperature in the borehole at total depth at the time it is measured.

6. Steps for experiment/practical:

- Calculate the mud circulation time, t, in hours.
- Calculate the recovery time, T (hours), for each logging run and fill in last but one column. (Note: remember to use decimal time in hours.)
- Calculate (t +T)/T, and fill in the table.
- Make a Horner plot of temperature on the y-axis (linear, 230 to 310 °F) against (t + T)/T on the x-axis (linear 1.0 to 2.0).
- What is the true formation temperature at 3300 m in °F and in °C? (Note that to convert °F to °C subtract 32, divide the result by 9, and then multiply by 5.)
- Given that the mean annual temperature of the sea-floor is 10 °C and that the sea-floor is 300 m below the logging depth measurement point, calculate the mean temperature gradient in the well in °C/m and in °F/m.
- What is the temperature in °F and in °C at 3100 m?

7. Observations/Discussions:

Process	Depth(m)	Temp(°F)	Time & date
Drilling Stopped	3300		22:00 / 15th
Mud Circulation stopped			04:00 / 16th
DIL log	3300	241	12:25 / 16th
FDC log	3300	257	15:00 / 16th
SNP log	3300	266	17:30 / 16th
Dipmeter	3300	273	20:30 / 16th

8. Percentage error (if any or applicable**):**

NA

9. Calculations/ Chemical Reactions / Theorems /Formulas used etc:

NA

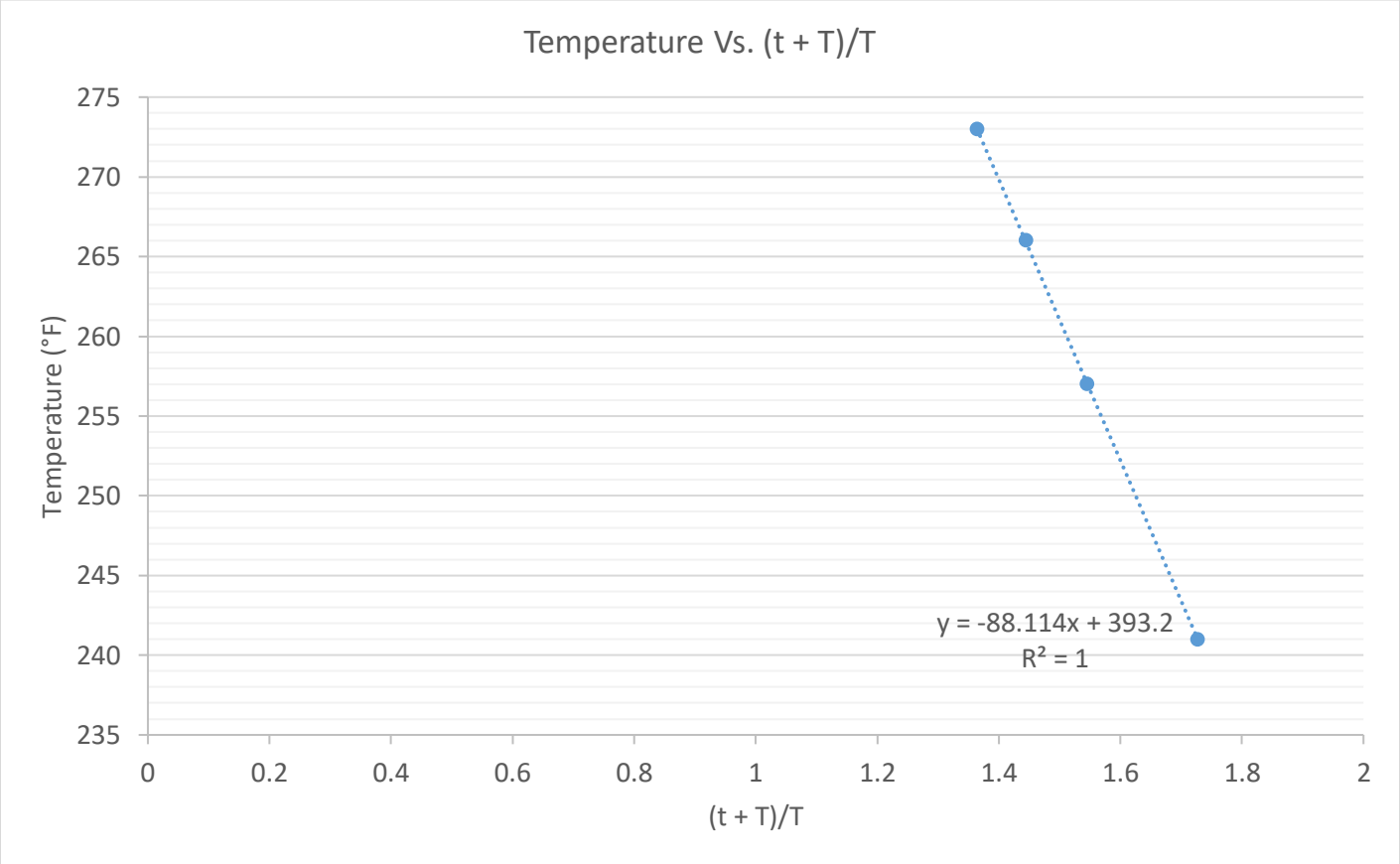
10. Result/Output/Writing Summary:

- Mud Circulation time = 6 hours.
- Answers 2&3:

Process	**Recovery time (hours)**	**(t + T)/T**
DIL log	8.25	1.727273
FDC log	11	1.545455
SNP log	13.5	1.444444
Dipmeter	16.5	1.363636

- Answer 4: (See the graph section) Made with MS excel.
- The true formation temperature at 3300 m is 305.08714 °F or 151.71508 °C.
- The mean temperature gradient in the well is 0.04724 °C/m or 0.08503 °F/m.
- The temperature at 3100 m is 146.43891 °C or 295.59004 °F.

11. Graphs (If Any):



12. Learning outcomes (What I have learned):

- The actual temperature measured is that of the drilling fluid not the formation.
- When the circulation of the drilling mud stops, the borehole gradually regains the true formation temperature.
- Because of the circulation of the drilling mud while drilling, the formation temperature is underestimated during temperature measurements.
- The Horner plot is used to correct the logged BHT to real formation temperatures.
- Learned how to perform the experiment.