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to: Charlene Lattier, 6848

from: Mary-Alena Martell, 6849

subject: Additional information for the DRZ (disturbed rock zone) porosity.

The DRZ porosity is represented in the database by the parameters id:178 DRZ_0: POROSITY and id:195 DRZ_1: POROSITY. The range used for the DRZ porosity is 0.0039 to 0.0329 with a best estimate (median) of 0.0129 (WPO# 32288). The range is obtained by the difference between the median value for the DRZ, which is 0.0129, and the median value for the halite porosity, which is 0.01. The difference of 0.0029 is added to the halite porosity range of 0.001 to 0.03 to obtain the DRZ porosity range. The DRZ porosity 'best estimate' value of 0.0129 was taken from a draft record dated January 6, 1996. The draft record was never submitted to records because the PI determined that the information was inadequate for its purpose; besides being correlated to initial brine saturation, DRZ porosity should also be correlated to the halite porosity. A new value of 0.0104 times halite porosity (WPO# 31184) was subsequently submitted on February 13, 1996, this value was not used by PA. The position of over-estimating release was considered appropriate (see WPO # 32288).

The impact for not using the recommended value is as such:

1.   The recommended value for DRZ porosity was 1.04 times the halite porosity. Therefore for all realizations the DRZ porosity value used in the calculations were greater. For example, the DRZ porosity median value should be 0.0104; a reduction in porosity of approximately 19%.

2.   If the initial brine saturation of the DRZ were adjusted accordingly, such as 0.775 for a porosity of 0.0129, and 0.769 for a porosity of 0.0104 (assuming 20% residual gas saturation), no real impact would be noticed.

3.   However, an initial brine saturation of 100% was used. Completely saturating the increased porosity results in increased cumulative brine inflow to the repository. The figures in WPO# 31184 are misleading; they appear to demonstrate that the lower the porosity the greater the brine inflow. But this is only true if it is less than 100% brine saturated (the initial brine saturations were around the values in bullet 2). If not truly brine saturated, storage for brine must be filled before brine flows into the repository.

4.   The higher porosity values used ultimately produce more brine inflow into the repository, 'over-estimating' the actual quantity of brine available for corrosion and transport.

The project position was given in WPO#32288. This position, it is believed, can be defended as being conservative (over-predicts brine and gas flow to and from the repository). Therefore, the range of 0.0039 to 0.0329 and a median of 0.0129 were used.

Please attach this memo to id:178 and id:195.

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