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Geological Study Of Mahiasmal Ghats Of Khultabad Taluk District Aurngabad

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Abstract: The Deccan volcanic, representing basaltic flows of Cretaceous-Eocene age, are the most extensive geological formation of Peninsular India. They cover total area of 80% area of Maharashtra state.

Keyword: Geological Study , amygdaloidal , solidification , Soil texture.

INTRODUCTION:

Compact basalt flows are always thick and extensive having tabular form. Their hickness varies from 7 m to 120 m. In compact basalt flow there is definite variation in the field haracters from its top to bottom The top surface of compact basalt flow is rather undulating. Immediately below the top surface, for some thickness, rock is hydrothermally altered, purple or greenish, vesicular amygdaloidal top portion of the flow. The middle and the lower portions of compact basalt flows are free from vesicles, and amygdales and they occur, in true sense, as compact basalt. Joints, which are the contraction cracks developed during cooling and solidification of the lava, always occur in middle and lower portions of the flow and rock occurs in dissected condition. There may be variation in the pattern of jointing and joint spacing. Joints may be closely spaced or broadly spaced. Sometimes joints may be inconsistent and may be interconnected.

STUDAY AREA:

Mahiasmal are located in Aurangabad District and Khuldabad Taluka the map showing the location of khultabad.

Soil texture:

Texture describes the Study area how coarse or fine a soil is. The coarsest soil particles are sand. Clay particles are the finest, and silt is intermediate in size Soils that contain a large amount of sand feel gritty, while silty soils feel hard when dry, and sticky and plastic (moldable) When moist. Sand particles resemble small rocks, and silt particles are like even samller rocks. Silt and sand particles are not very active chemically; they contribute little to the ability of the soil to adsorb (bind) contaminants. Most clay particles are structurally and chemically quite different from sand and silt, and are smaller. Clay is responsible for much of the chemical activity and water holding capacity in soils.

Texture influences the porosity as well as the chemical activity of a soil. Sandy soils contain mostly large pores. They hold little water, and excess water drains through them easily. The combination of low chemical activity and rapid water movement through sandy soils makes them more vulnerable to leaching of contaminants than finer – textured soils. Soils which are mostly silt or clay have mostly small pores that do not drain water readily. The risk of groundwater contamination is much less in these soils. They must be managed carefully, however, to prevent runoff and surface water contamination.

A loam is a soil that contains a roughly balanced mixture of sand, silt, and clay Loamy soils have more chemical activity than sandy soils, and hold more water. They offer more protection to groundwater. Also, water tends to infiltrate through them more readily than through fine-textured soils, so the risk of runoff is less.

GEOLOGY OF THE AREA

The traverse of this Gaht starts from khultabad village on khultabad-Mhaismal road. Form Khultabad village there are discontinuous patches of thin, irregular, amygdaloidal basalt flows. However, as the major part of the road is nearly on flat ground, the individuals thin, irregular, amygdaloidal basalt flows, have not been demarcated and numbered separately. The actual ascent of the Ghat and rock

cuts along the road. where on the top of these thin, irregular, amygdaloidal basalt flows, a flow of green, tachylytic basalt flow is exposed for a very short distance. The thickness of this flow is about is about 30 cm.

AMYGDALODIAL BASALT FLOWS

The amygdaloidal basalt original gas cavities are filled up with secondary minerals obliterating their original vesicular nature. In addition to this, they are unjointed therefore they occur as homogeneous, watertight mass in fresh, unweathered conditions. Therefore no rain water percolates through fresh amygdaloidal basalt to form groundwater. However, it is observed that, if amygdaloidal basalt has undergone intermediate stage of weathering, sheet jointing and secondary porosity are induced in it. Such weathered amygdaloidal basalt contains groundwater. However, quantity of groundwater depends upon the thickness and extent of weathered zone.

COMPACT BASALT FLOWS

Every compact basalt flow can broadly be demarcated into two parts according to their hydrological characters. The top portion of compact basalt flow is always vesicular, amygdaloidal, unjointed and watertight in fresh condition. Only in weathered condition ground water occurs in it due to development of sheet jointing and secondary porosity. If fresh amygdaloidal top portion of compact basalt flow is exposed at the surface rain water does not percolates through it. But if weathered, sheet jointed amygdaloidal top portion of the flow is exposed at the surface then only rain water enters through it forming ground water.

VOLCANIC BRECCIA

Volcanic Breccias with tachlytic matrix and grey lava matrix occur as water tight rock. Therefore no rain water percolates through them. In volcanic breccias in which rock fragments are held together by zeolites, some voids occur, therefore small quantity of water may percolates through them.

As mentioned previously, middle and lower portions of compact basalt flows are jointed. It jointed portions of Compact basalt flow are exposed at the surface; rain water percolates through joints forming ground water. However, quantity of percolation of water depends upon joint spacing and pattern of jointing.

In closely spaced jointed basalt considerable quantity of rain water may percolate through the joints. But if joints are broadly spaced limited quantity of water percolates through them. Basalt having inconsistent jointing occurs as watertight mass even though it is jointed. Joints generally open out at the surface but gradually, at the lower level, they become tight and occur as only weak planes.

Although water percolates through the joints of compact basalt, large percolation up to deeper level cannot take place and therefore, compact basalt always holds limited quantity of water.

Flow No. MH-1:

It starts appearing from along the road level. It is a black, compact porphyritic Basalt with medium sized plagioclase phonocrysts which are fresh. These phenocrysts are scattered throughout the Flow. At some places along whth the plagioclase phenocrysts some corer red colored iddingsite flakes altered after olivine are seen. At some places in this flow towards the top, horizontal stringers of vesicles are seen. In the lower portions, the flow shows broadly spaced jointing with roughly three sets of joints which are almost perpendicular to each other. Along these three sets of joints, spheroidal weathering has been developed. In the middle portion after the joints are closely spaced. In this portions the number of phenocrysts have become smaller and the flow appears to be aphanites basaltic.

From the top portions of this flow, green and red, nearly vertical and steeply inclined thin, intrusions of tachlytic basalts are seen. The top portion of this flow has become hydrothermally altered, purple in color vesicular amygdaloidal with medium sized amygdales filled with chlorohaeite and heulandites. The road rises above this flow.

Flow No. MH-2 :

This flow starts appearing along the road level. It is a compact porphyritic basalt with small plagioclase phenocrystes which are crowded in the flow. On weathering due to removal of these phenocrysts, the flow has acquired very rough and rugged appearance. It show broadly spaced jointing and has developed spheroidal weathering. The top portion of this flow has become purple and vesicular amygdaloidal with large amygdales filled with silica and zeolites. From there are no outcrops of the flow as it is canceled under soil cover. The road rises above this flow

Flow No.MH-3:

It starts appearing form along the road level. It is black compact porphyritic basalt, with small plagioclase phenocrysts scattered throughout the flow. In the lower portions of this flow horizontal jointing is prominently developed. The top portions of this flow have become vesicular and amygdaloidal. Due to steep gradient the road rises above this flow .

Flow No.MH-4:

On the top of flow numerous thin, irregular, amygdaloidal basalt flows are occurring. Out of these three flows have been sketched from their petro logical description is given along with the sketch. similarly five flows exposed. They have been sketched and their petro logical description is given along with the sketch. The junction between these thin, irregular, amygdaloidal basalt flow and above lying compact prorhyritic basalt flow is very irregular. At the junction is 2 m. above the road level but within a distance of 25 m. the junction nearly comes to the road level and again it goes up at a higher level 3. Above the road with a distance of 20 m. flow is a compact porprhyritic basalt with small plagioclase phenocrysts. The flow is broadly spaced jointed in the bottom portions. At higher level it has become closely spaced jointed. The road rises above this flow

Flow No.MH-12:

On the top of flow No.MH-12 there occurs a thin flow of green tachylytic basalt with is 60 cm. thick. It pinches

out within a short distance.

Flow No.MH-14:

It starts appearing from the top of green tachylytic basalt i.e. flow No. MH-13. It is a black compact porphyritic basalt with small plagioclase phenocrysts. At places vesicles filled with green chlorophaeite are occurring in this flow. In the hill slope where the road cuts againg start, the junction between flow No. MH-14 and the above lying flow No.MH-15 is clearly exposed

Flow No.MH-15:

The flow No. MH-15 is a thin red tachylytic basalt having 30 cm. thickness. It phiches out within a short distance.

Flow No.MH-16:

It starts appearing in the same cut above the red tachylytic basalt, flow No.MH-15. This flow No.MH-16 is compact porphyrittic basalt. The top of the flow is clearly exposed in the road cut on the top of flow No.MH-16, flow No.MH-17 is exposed.

Flow No.MH-17:

It is exposed on the top of flow No.MH-16 with pipe amygdales at its base. On this flow an extensive plateau is developed on which rest house is located where the traverse ends. The flow No.MH-17 is a back, compact, porphyritic basalt. It shows closely spaced jointing.

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