

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF**  
**SHRI GYANENDRA SINGH S/O SHRI SUNDER SINGH FOR THE**  
**CONSTRUCTION OF OWNER DRIVEN CONSTRUCTION HOUSING (ODCH)**  
**VILLAGE-NAGANGAON (THAN GAON), TEHSIL- BARKOT, DISTT.-**  
**UTTARKASHI**  
**KHASARA NO – 3121(a)&AREA – 0.025 ha**

**Date of Inspection: 19-12-2013**

## **1. INTRODUCTION:**

In a 'World Bank' funded programme, Government of Uttarakhand has provided teams of Consultant Geologists and Consultant Associate Geologists to Director, Geology and Mining Unit, Uttarakhand for geological studies in proposed sites for Owner Driven Construction House (ODCH) in disaster affected districts of Uttarakhand. Director, Geology and Mining Unit, Directorate of Industries, Uttarakhand has issued an Office Order No.1612 Aa. Pra./Bhu.Ni./Bhu.Khani.E./2013-14 dated 10<sup>th</sup> December 2013 regarding geological studies in disaster affected five districts of Uttarakhand. Uttarkashi is one of them. Thus undersigned traversed and collected field geological observations under the management of cosignatory departmental 'Assistant Geologist'.

In the above mentioned questioned area, the reconnaissance geological investigation was carried out in the presence and co-operation of Shri Bharat Singh Rawat, Revenue Sub-Inspector, Nagangaon, for proposed site of Shri Gyanendra Singh S/o Shri Sunder Singh, Village Nagangaon (Than gaon), Tehsil- Barkot, Khasara No- 3121(a), and Area- 0.025 ha. The site is 12km approximately from Tehsil Barkot, District Uttarkashi, Uttarakhand and is approachable 9km by NH-123 (Delhi-Yamunotri National Highway) and then 3km via Nagangaon-Masalgaon Motor road. The site is 12-15m from the road in South direction. It falls on coordinates – N 30°50.458' E 78°15.265' and elevation 1388m. The site is on the right bank of river Yamuna and is about 400-500m approximate distance from the Yamuna river bank, in South direction. The site is less populated.

## **2. GEOMORPHOLOGY OF THE PROPOSED AREA:**

The proposed site is situated on a flat terrace about 12-15m downhill in South direction from the Nagangaon-Masalgaon Motor road. The overburden thickness in the proposed site is about 30-40m approximately and is alluvial in nature. The uphill slope from the site is 55°-60° towards South direction and the downhill slope of the site is very gentle approximately 1°-2° towards South direction. There is steep slope of 70°-80° downhill in West direction up till the Badiyar Khad Nala. The Badiyar River is approximately 40-50m in West direction from the proposed site and is flowing in South direction. It meets the main Yamuna

River 500m downstream towards South direction. The proposed site is less vegetated and cultivated terraces are present.

### **3. REGIONAL GEOLOGY AND GEOLOGICAL OBSERVATION AROUND THE CONSTRUCTION SITE:**

Uttarkashi valley exhibits characteristic rugged topography of the Lesser Himalayan terrain. The ground elevations generally vary between 1150m to 2000m above msl. The hill slopes in the area are generally observed to comprise of rocky outcrops, rocky cliffs and mantle of colluviums. The hill slopes in the area is generally moderately steep ( $25^{\circ}$ -  $35^{\circ}$ ) to steep ( $36^{\circ}$ -  $45^{\circ}$ ) while few escarpments or cliffs ( $> 50^{\circ}$ ) are also present. Uttarkashi town is located in the Lesser Himalayan geotectonic block and it is bound by two major Thrust fault i.e. Main Central Thrust (MCT) and Srinagar Thrust (ST). The MCT can be traced to the northeast of Uttarkashi while the Srinagar Thrust lies in the southwest. Phyllite, metabasic and quartzite of Garhwal Group are exposed around the area.

Geologically, the area falls in the region of rocks of Bhatwari-Barkot Formation (= Chail) of Ramgarh Group of Lesser Himalayan terrain, the rocks are mainly phyllites, quartzites with intrusion. It should be emphasized that the quartzites, phyllites and metabasics (= Chail) directly underlying the crystalline are a typical phenomenon for all the Himalayas.

No in-situ rocks are found near the proposed site. The site is consolidated and stable.

### **4. GEOTECHNICAL OBSERVATION OF THE PROPOSED CONSTRUCTION SITE:**

The proposed area is on a flat alluvial deposit man made terrace. The slope of the uphill of the site is  $55^{\circ}$ - $60^{\circ}$  towards South direction. The Nagangaon-Masalgaon motor road and some houses in the NW direction have been constructed within the past 5 years. The soil is alluvial type, brown color, silty clay material of 3-4m thickness. The proposed site depending on the geotechnical observations is stable for the construction of the house.



**A front view of the proposed site from South direction.**



**A side view of the proposed site from SE direction.**

## 5. RECOMMENDATIONS:

Based on above surface geological observations of the proposed area the following remedial measures for construction of a geologically suitable house are recommended:

1. An inclined retaining wall of 1-2m must be constructed in both North and South direction of the proposed site with proper weep holes at specific distance to avoid seepage into the house.
2. The foundation depth of the houses must be as per the compactness of the overburden material in the proposed site.
3. A sufficient gap of about 2-3ft must be kept between the backside retaining wall and the backside wall of the proposed house to prevent seepage into the house.
4. The back, sides and premises of the houses must be made cemented to prevent subsurface seepage and a proper drainage system to be developed.
5. The area falls in Lesser Himalayan earthquake zone IV so the houses must be erected with latest earthquakes resistive techniques, scientific and technically sound craftsmanship.

## 6. CONCLUSION:

Prima-facie, presently, the proposed site of Shri Gyanendra Singh S/o Shri Sunder Singh is geologically feasible for the proposed construction, only if, the above mentioned recommendations will be followed strictly, otherwise, in their contravention; the geological suitability will be deemed annulled.

*Anupriya*

(Anupriya Shah)  
Consultant Associate Geologist

**Date:** 25<sup>th</sup> Dec 2013

**Place:** Camp Uttarkashi

*Deepak*

(Deepak Singh)  
Consultant Geologist

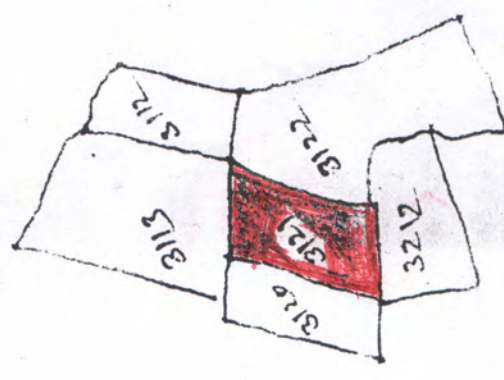
*d/s*

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Assistant Geologist  
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 तहसील बडकोट, जिला उत्तरकाशी जहां पर स्वी आपदा प्रभावित परिवार हेतु  
 प्रीफेब्रिकेट भवन निर्माण हेतु भूमि प्रस्तावित की जा रही है।

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