STUDY AREA AND SITES

Bhilai Steel Plant (BSP) Bhilai is situated at 21°10' N latitude & 81°20' E longitude in Madhya Pradesh (Fig. 1). The steel plant was started in the year 1959. It is the largest integrated steel plant in our country with an annual production capacity of about 4 million tonnes (Sekhar 1988). Bhilai is situated 32 Kilometers away from Raipur city on its west on G.E. road. The liquid effluent from the entire BSP industrial area is collected and discharged through two channels (Fig 2). One channel collects waste water from mould yard and No. 1 foundary, oxygen plant, steel structural shop, machine shop, steel melting shop, power generation, blast furnace, RMP, NSDS, roll turning shop, diesel loco shop, rail and structural mill and wire rod mill, this channel is named, Samodha nala (Fig 3). It runs westward and joins river Sheonath, which is tributary to river Mahanadi. The other channel collects water from coke ovens, sinter plant and rolling mills (Fig 3). this channel joins another canal called purena nala and then forms the
somni nala. This channel runs about 15 Km eastward and joins river Kharoon which is tributary to river Sheonath. Somni nala is a perennial canal with a zigzag path. The nala at the origin has about 4-5 M width and 3-4 M depth, but after the joining of Purena nala it has a width of about 10-12 M and a depth of about 7-8 M. The colour of the effluent is dark brown throughout the year and has a black deposit along the banks (Plate 1) Typha angustata grows very commonly on the effluent sediment, with its own gregarious growth habit. The waste water from BSP, after travelling a distance of about 2 Km., is diverted for irrigation (Plate 2). At this point there is a temporary storage of waste water. In this water Typha angustata and Potamogeton Sp. make good growth (Plate 3). On the surface of the exposed sediment, along the margin of the effluent channel, cyanobacteria, form a crust like growth (Plate 4). It is very common also to observe bathing of people and cattle washing, in this effluent water, without any complaints or ill effects.

The soil on the two sides of effluent channel are either Bhata Soil (Plate 5) or a vertisol, which is locally called Kanhar soil. Kanhar is a black soil which had 27.40% and, 21.72% silt and 50.88% clay.

Along the effluent channel, two points were selected for collecting the sample (Fig 3).

(1) Site 1 was located at about 2 Km downstream to the point of its origin, from the steel plant area, and at the
point of diversion of the effluent for irrigation (Plate 2). Collection of effluent sample from this site was made at about weekly to fortnightly intervals. Effluent from this site was used for experimental irrigation of soil and plants.

(2) Site 2 was located at about 100 M upstream to the point of joining of the effluent channel with the Kharoon river. This site is thickly covered with trees, mainly *Terminalia arjuna* and *Pithecolobium dulcis*. (Plate 6). Effluent sample from this site was also collected at weekly to fortnightly intervals. Simultaneously, sample from this site was analysed for seven continuous days also.

Algae were collected mainly from upstream to sampling site 1, from the exposed crust, and in the effluent from both the sites.