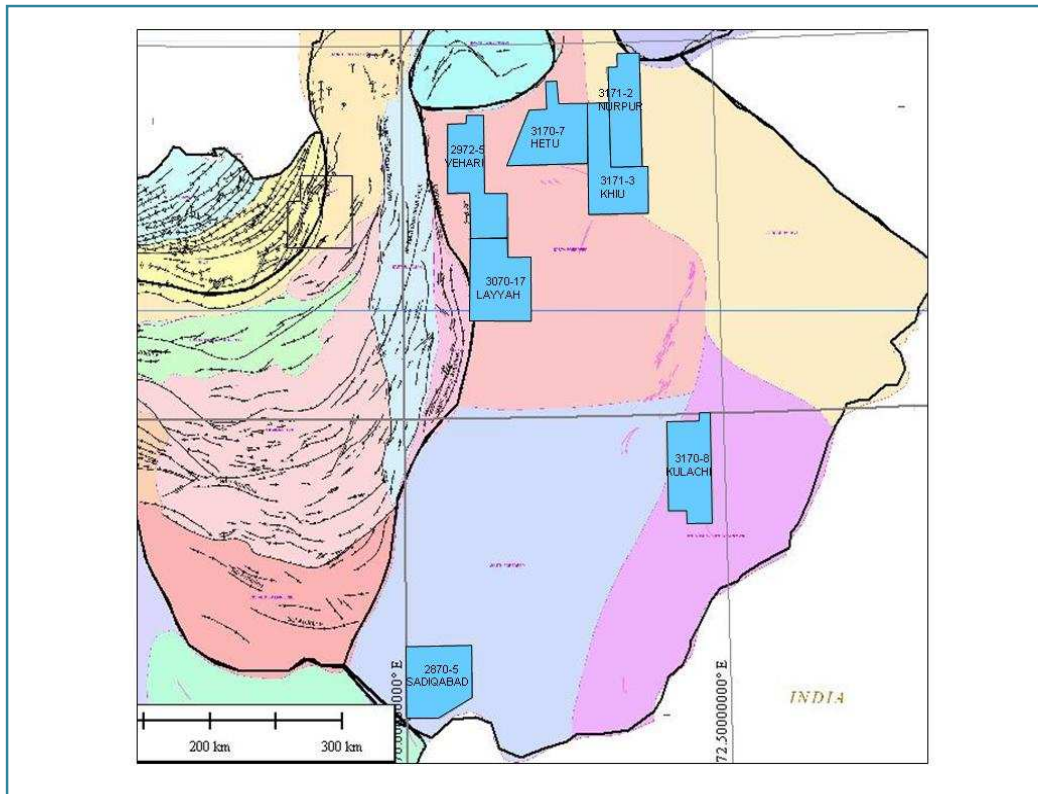


## CENTRAL INDUS PLATFORM BASIN

### LOCATION

The Nurpur, Hetu, Khiu, Kuclachi, Layyah, Vehari and Sadiqabad Blocks are located in the Central Indus Platform Basin and lies in the Punjab Province.



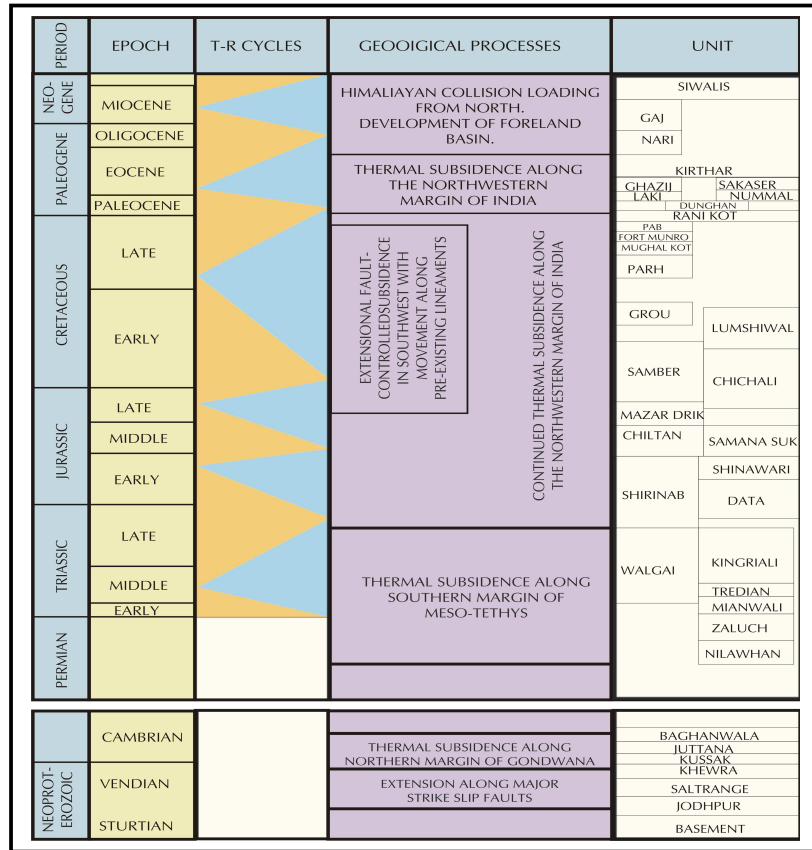
### GEOLOGICAL FRAMEWORK

Central Indus Platform Basin (CIPB) rests on the continental margin of Indo-Pakistani Plate. CIPB is bounded in south by Jaisalmer-Mari-Kandhkot High, while Sulaiman Range defines the western boundary. The Sargodha Ridge (Kirana Hills) marks the north-eastern boundary. The Punjab Platform dips westward into the Sulaiman Foredeep. The structural style of the Central Indus Platform Basin is obscured at surface by thick alluvial cover. Seismic and drilling studies reveal sub-surface structural features related mainly to phases of Precambrian to Cambrian and Mesozoic extension but also to the effect of the peripheral collisional orogenies and consequent foreland basin deposition.

**STRATIGRAPHY**

CIPB was in a passive margin setting, while sediments were probably laid down under partly restricted shallow marine conditions in interior rifts in intermittent connection with Tethys. Cambrian sediments are overlain unconformably by the Permian sequence. Shallow marine to paralic conditions prevailed throughout the area up to the Late Triassic. A thick succession of fine grained clastics was deposited in response to passive margin thermal subsidence during the

Early Jurassic. High global sea levels resulted in the establishment of a widespread carbonate platform over the area. The Middle Jurassic carbonate platform was replaced by shallow marine to deltaic shale and sandstones. During the Late Cretaceous carbonate platform replaced by a more clastic-dominated regime, relatively quiescent conditions on the passive margin in the north resulted in the deposition of Late Eocene carbonates. Throughout the Oligocene, the Indian Ocean coastline



gradually migrated southwards, so that marine conditions were progressively replaced by continental conditions. By the Middle Miocene the collision between the Indian and Eurasian Plates had resulted in deposition of widespread molasse deposits.

**PETROLEUM SYSTEM**

The producing field (Nandpur and Panjpir) in the south-west indicate the presence of a valid petroleum system in the area.



**SOURCE ROCKS**

The Infra-Cambrian shale has been considered by many authors to be an excellent source rock, total organic carbon content (TOC) ranging from 3.75% to 30%. Datta and Shinawari Formations of Jurassic age show good to very good potential. Pyrolysis data indicate that the Datta Formation in the Nandpur-1 well is at the beginning of the oil window. Sembar has TOC up to 2.84% of type II & III kerogen. Mughalkot shale has TOC in the range of 0.55 to 1.0 % of type III kerogen. Shale in Paleocene (Ranikot/Patala) has TOC up to 3.47 % of Type III kerogen. The shale of Sui Formation in Dhandi-1 and Sabzal-1 shows good source potential. Rubbly Limestone Formation has approximately 300 metres of good source rock in the Savi Ragha-1 well while Domanda Shale has TOC values ranging from 1.25% to 3.42% with HI values from 194 to 654 mgHC/gTOC. Oil generation and expulsion could be expected from these intervals if deeply buried.

**RESERVOIR ROCKS**

Expected reservoir targets include Jodhpur Sandstone and Bilara Dolomite of Infra-Cambrian, Khewra, Kussak, Jutana and Baghanwala formations of Cambrian age and Tobra and Wargal formations of Permian age. The carbonates sequence in Mesozoic, sandstone of Early Cretaceous lower Goru/Sembar formations could also be possible reservoirs. Late Paleocene Dunghan Limestone and Early Paleocene sandstones of Ranikot Formation have good reservoirs characteristics.

**SEAL ROCKS**

Hanseran Evaporite of Salt Range Formation, marine mudstone (Kussak) and shallow marine mudstones of Dandot Formation are potential seals. The shale in Chhidru Formation, shale within the Datta Formation and Patala/Ranikot shale are good seal for underlying reservoir. Ghazij shale (Eocene) is the regional seal in the area.

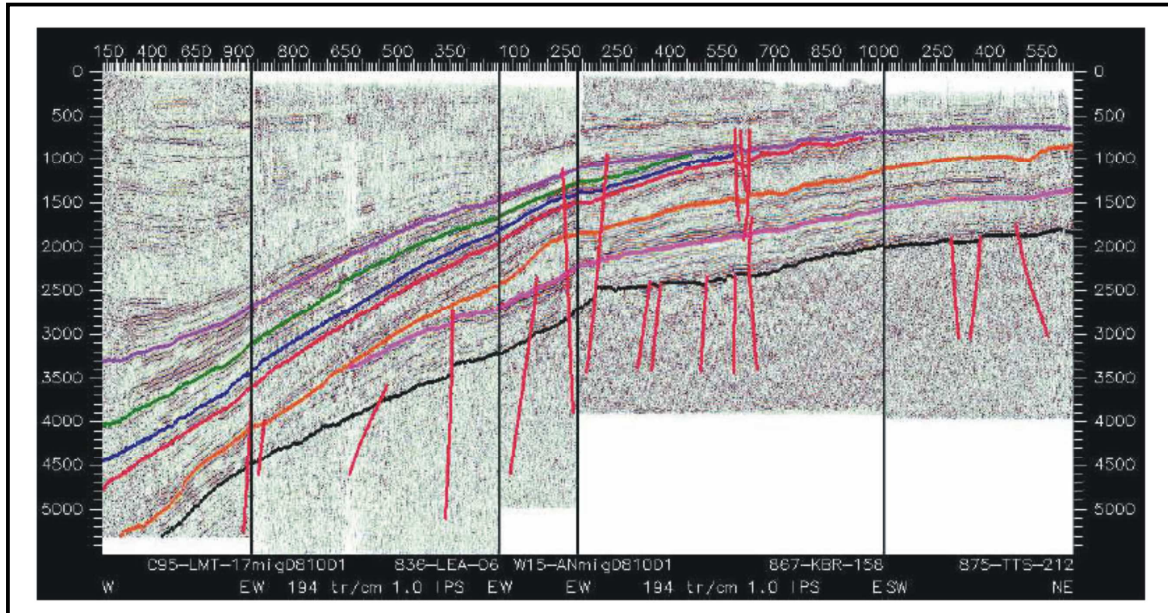
**TRAPPING MECHANISM**

Possible traps associated with the Infra-Cambrian and Cambrian rift phase include tilted, low relief fault blocks, although any such faults that exist appear to have low displacements. Reverse drag around normal faults has previously been ascribed to rollover, but the planar geometries of the faults in the Central Indus Platform Basin suggest the hanging-wall geometries are controlled by strain around faults. Normal fault-related structures appear to be the most common potential fault-related traps.



Infra-Cambrian halite has undergone halokinesis in the Arabian Plate basins and there is some evidence for this in the Central Indus Platform Basin, where folding occurs in the surrounding beds, salt solution and withdrawal features on the Punjab Platform.

Potential stratigraphic traps occur, especially beneath the base Tertiary or base Miocene unconformities. There is potential for sealing in fluvial shales of Murree Formation.



Structural Style in the Central Indus Platform

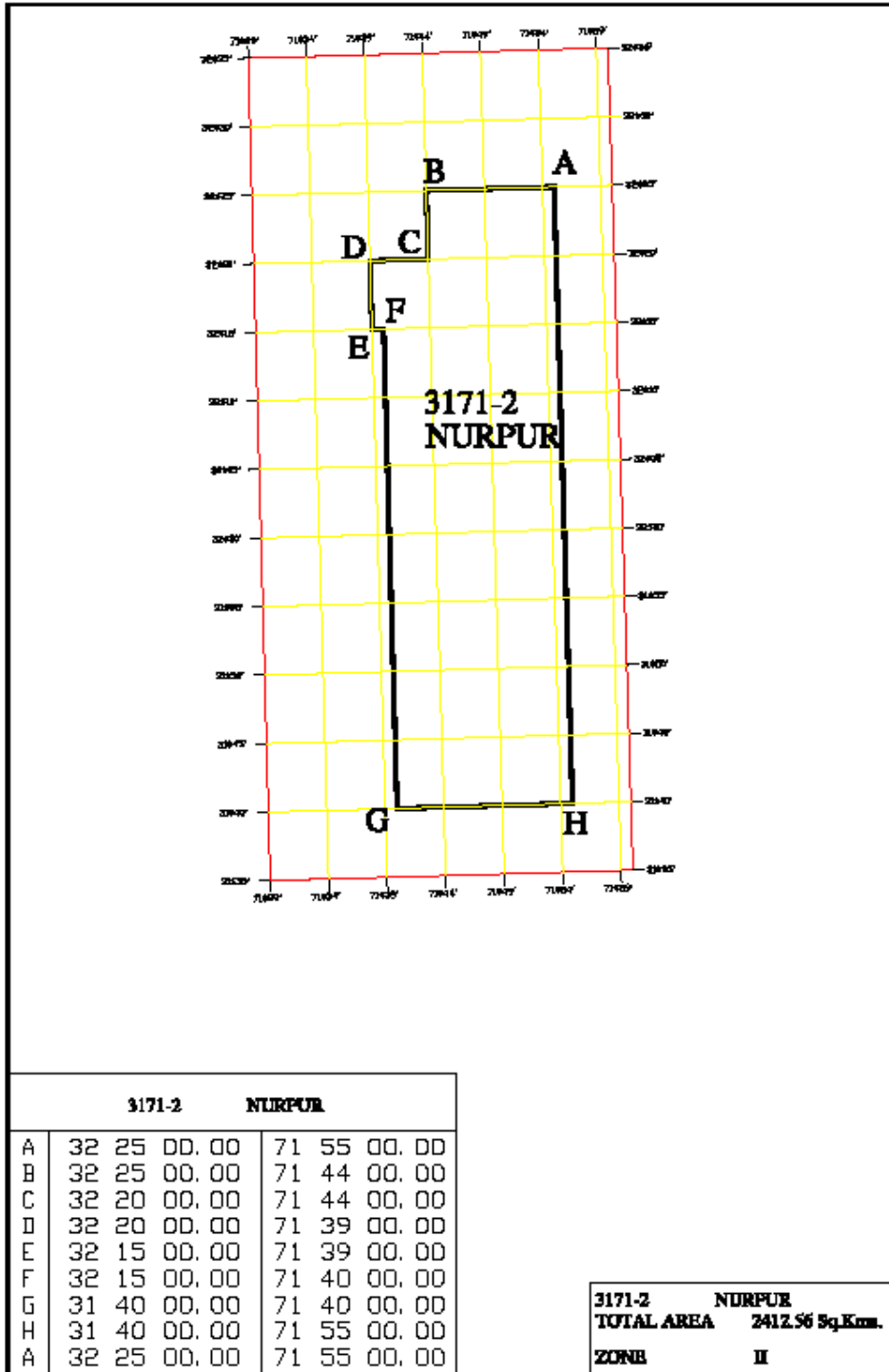
CENTRAL INDUS PLATFORM BASIN CO-ORDINATES FOR NEW BLOCKS				
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	71 55' 00"	32 25' 00"	3171-2 NURPUR	2412.56 Sq.Kms.
B	71 44' 00"	32 25' 00"		
C	71 44' 00"	32 20' 00"		
D	71 39' 00"	32 20' 00"		
E	71 39' 00"	32 15' 00"		
F	71 40' 00"	32 15' 00"		
G	71 40' 00"	31 40' 00"		
H	71 55' 00"	31 40' 00"		
A	71 55' 00"	32 25' 00"		
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	71 15' 00"	32 5' 30"	3170-7 HETU	2432.37 Sq.Kms.
B	71 15' 00"	32 15' 00"		
C	71 10' 0.39"	32 15' 00"		
D	71 9' 29.78"	32 03' 29.53"		
E	71 0' 50.07"	32 03' 25.44"		
F	70 50' 20.09"	31 41' 26.29"		
G	71 29' 00"	31 41' 26.29"		
H	71 29' 00"	32 05' 30"		
A	71 15' 00"	32 05' 30"		
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	71 40' 00"	32 05' 30"	3171-3 KHIU	2395.64 Sq.Kms
B	71 29' 00"	32 05' 30"		
C	71 29' 00"	31 21' 00"		
D	71 57' 00"	31 21' 00"		
E	71 57' 00"	31 40' 00"		
F	71 40' 00"	31 40' 00"		
A	71 40' 00"	32 05' 30"		
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	70 32' 00"	31 12' 00"	3170-8 KULACHI	2494.89 Sq.Kms.
B	70 32' 00"	31 30' 31"		
C	70 21' 30"	31 30' 31"		
D	70 21' 30"	31 58' 30"		
E	70 30' 46"	31 58' 30"		
F	70 30' 46"	32 01' 38"		
G	70 39' 5.07"	32 01' 38"		
H	70 38' 71.7"	31 30' 00"		
I	70 50' 00"	31 30' 00"		
J	70 50' 00"	31 12' 00"		
A	70 32' 00"	31 12' 00"		
VERTICES	LONG_DMS	LAT_DMS		
A	70 32' 00"	31 12' 00"	3070-17 LAYYAH	2459.20 Sq.Kms
B	70 32' 00"	30 39' 30"		
C	71 00' 00"	30 39' 30"		
D	71 00' 00"	31 04' 00"		
E	70 50' 00"	31 04' 00"		
F	70 50' 00"	31 12' 00"		
A	70 32' 00"	31 12' 00"		

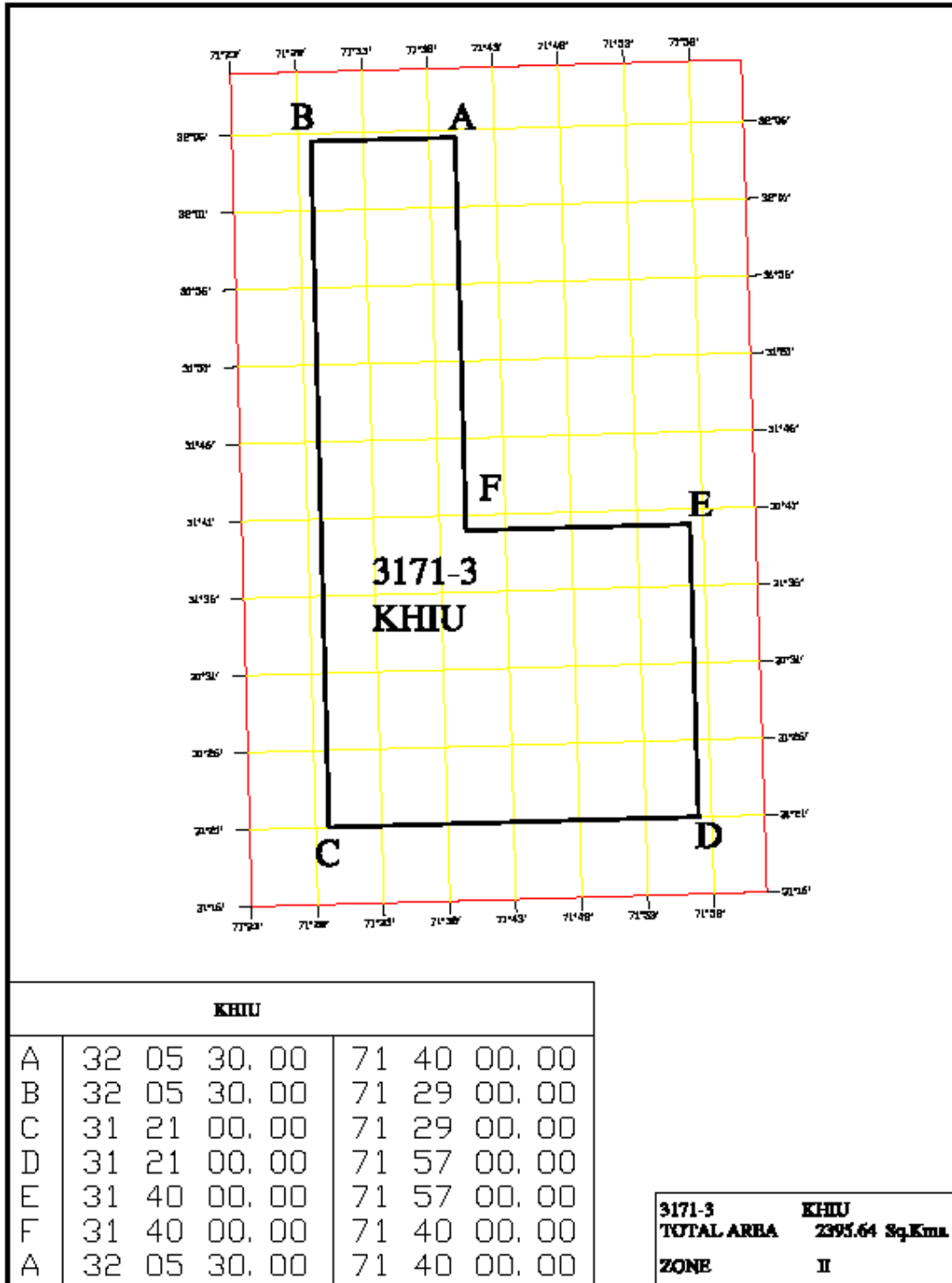


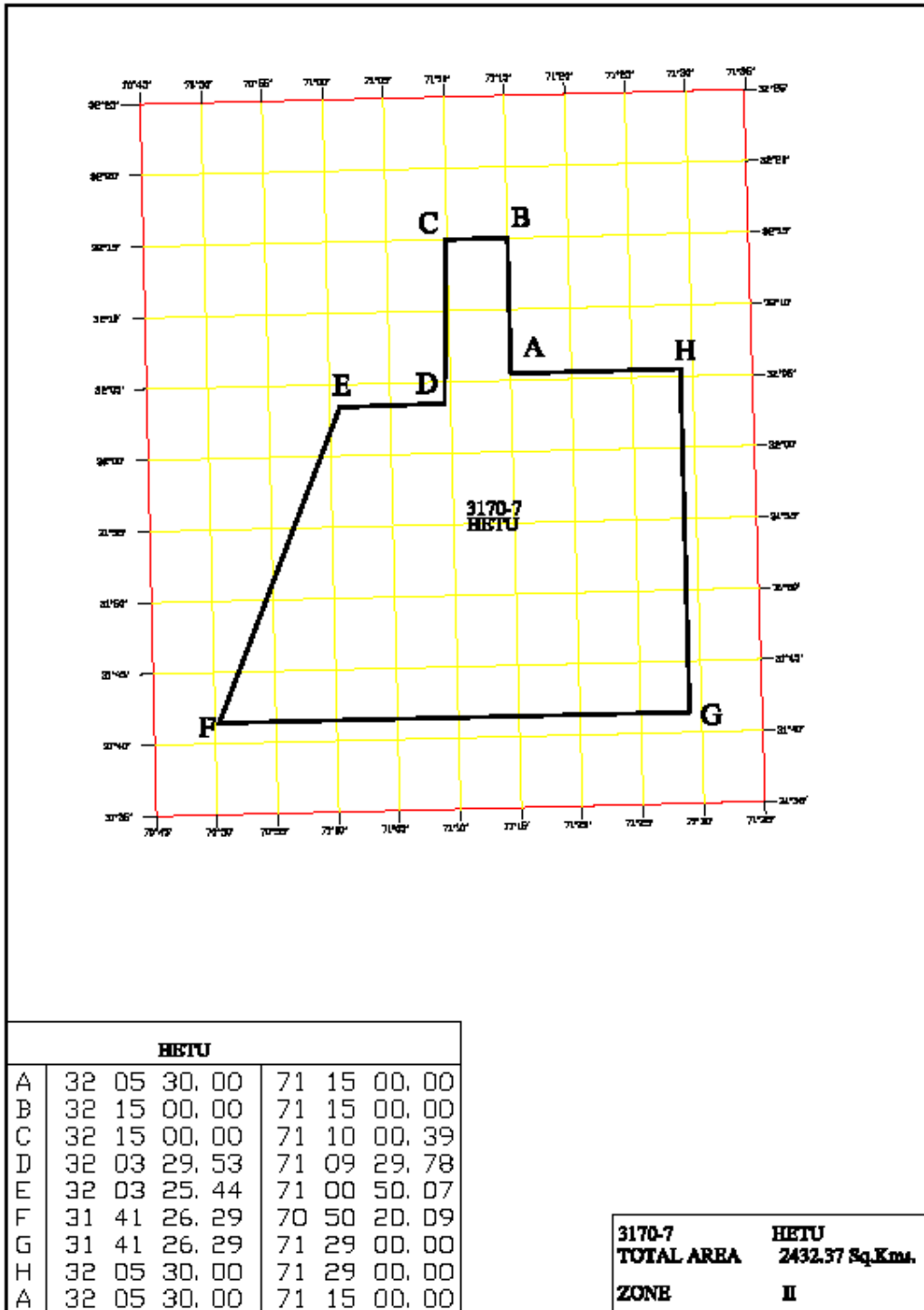
## NEW BLOCKS FOR BIDDING ROUND 2010

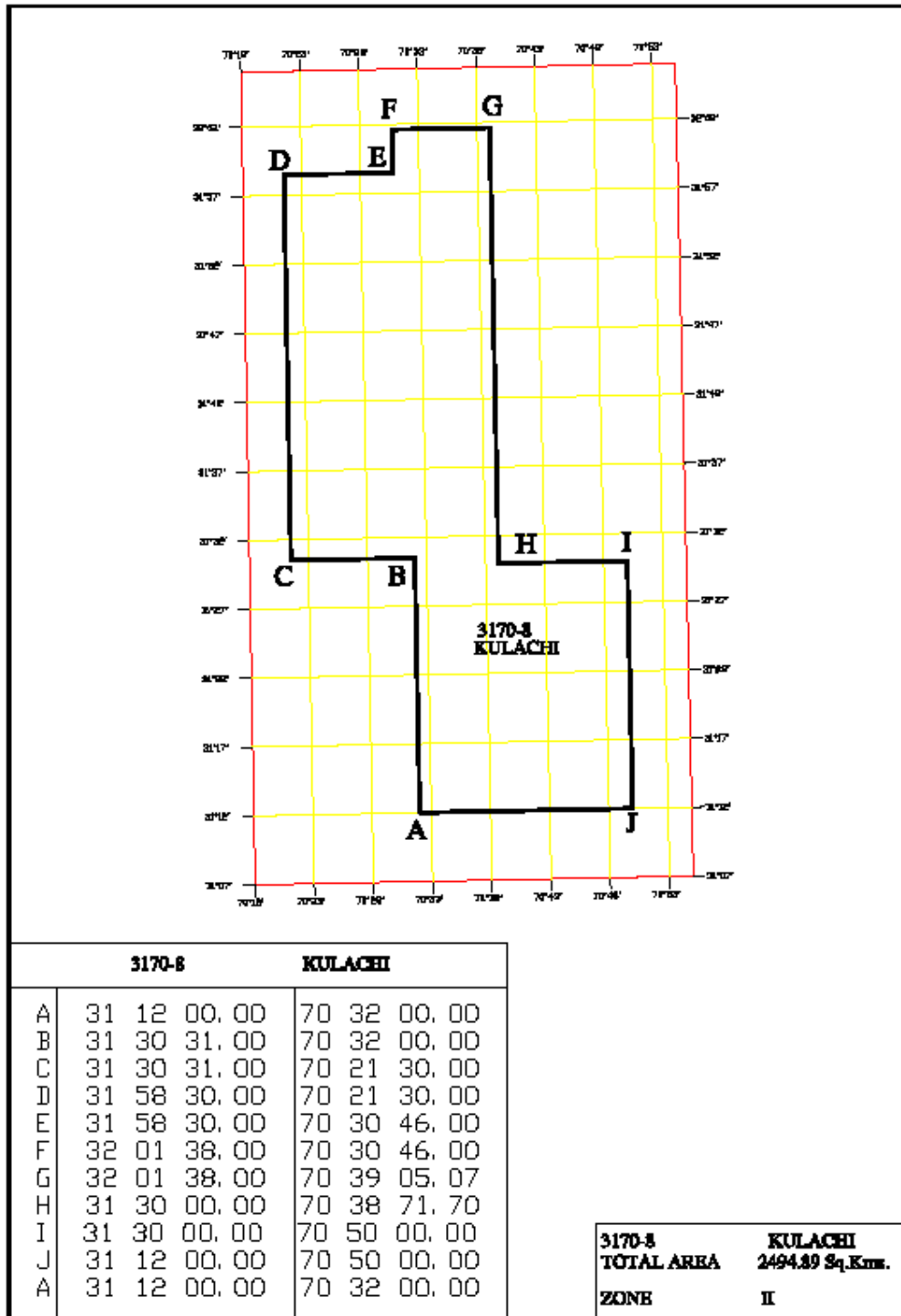
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	72 03' 00"	29 57' 00"	<b>2972-5 VEHARI</b>	<b>2487.28 Sq.Kms</b>
B	72 19' 8.32"	29 57' 00"		
C	72 19' 8.32"	30 00' 00"		
D	72 24' 00"	30 00' 00"		
E	72 24' 00"	29 16' 00"		
F	72 12' 00"	29 16' 00"		
G	72 12' 00"	29 21' 00"		
H	72 03' 00"	29 21' 00"		
A	72 03' 00"	29 57' 00"		
VERTICES	LONG_DMS	LAT_DMS	BLOCK NAME	AREA COVERED
A	70 00' 00"	28 00' 00"	<b>2870-5 SADIQABAD</b>	<b>2430.85 Sq.Kms</b>
B	70 15' 00"	28 00' 00"		
C	70 30' 00"	28 08' 00"		
D	70 30' 00"	28 28' 47"		
E	70 00' 00"	28 28' 47"		
A	70 00' 00"	28 00' 00"		

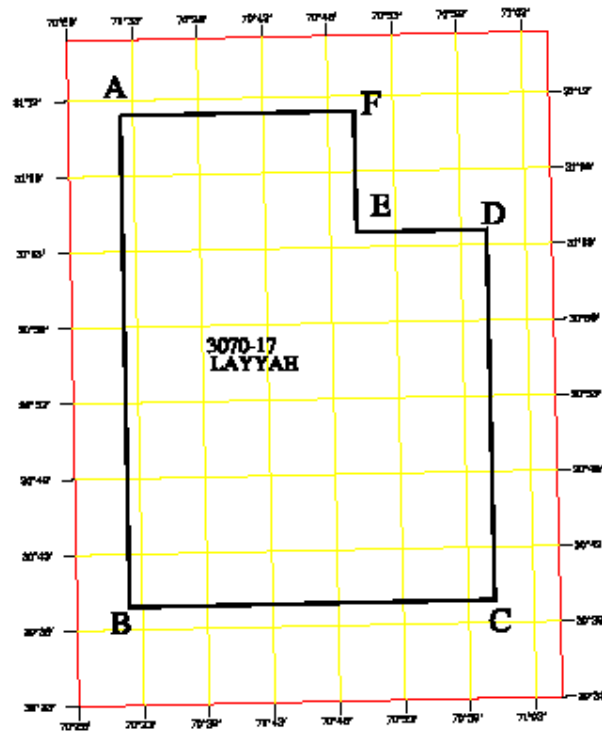








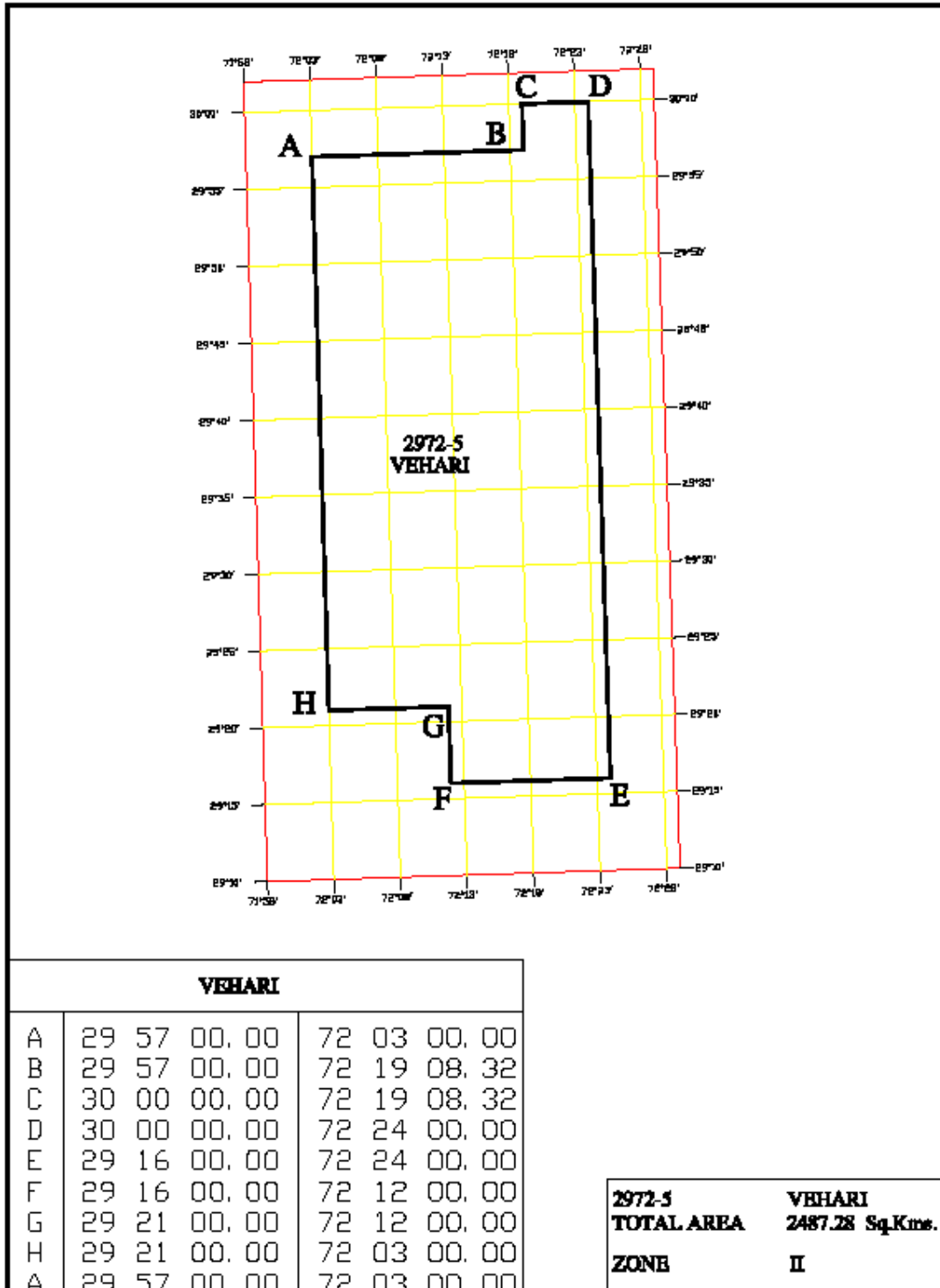


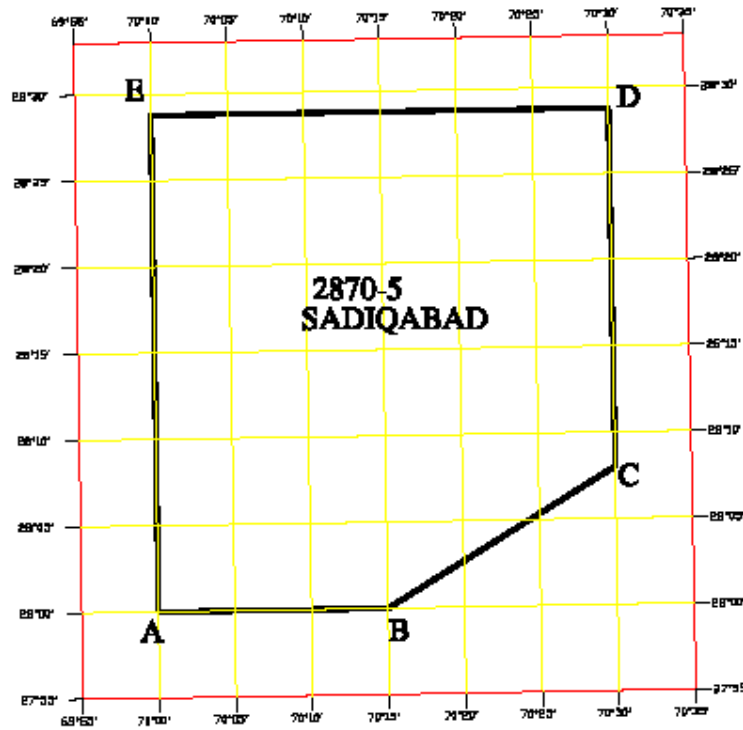


	3070-17	LAYYAH
A	31 12 00.00	70 32 00.00
B	30 39 30.00	70 32 00.00
C	30 39 30.00	71 00 00.00
D	31 04 00.00	71 00 00.00
E	31 04 00.00	70 50 00.00
F	31 12 00.00	70 50 00.00
A	31 12 00.00	70 32 00.00

<b>3070-17</b>	<b>LAYYAH</b>
<b>TOTAL AREA</b>	<b>2459.20 Sq.Kms.</b>
<b>ZONE</b>	<b>II</b>







SADIQABAD			
A	28 00 00.00	70 00 00.00	
B	28 00 00.00	70 15 00.00	
C	28 08 00.00	70 30 00.00	
D	28 28 47.00	70 30 00.00	
E	28 28 47.00	70 00 00.00	
A	28 00 00.00	70 00 00.00	

<b>SADIQABAD</b>	
<b>TOTAL AREA</b>	<b>2430.85 Sq.Kms.</b>
<b>ZONE</b>	<b>III</b>

