



# PROJECTS

## SPACE MONITORING

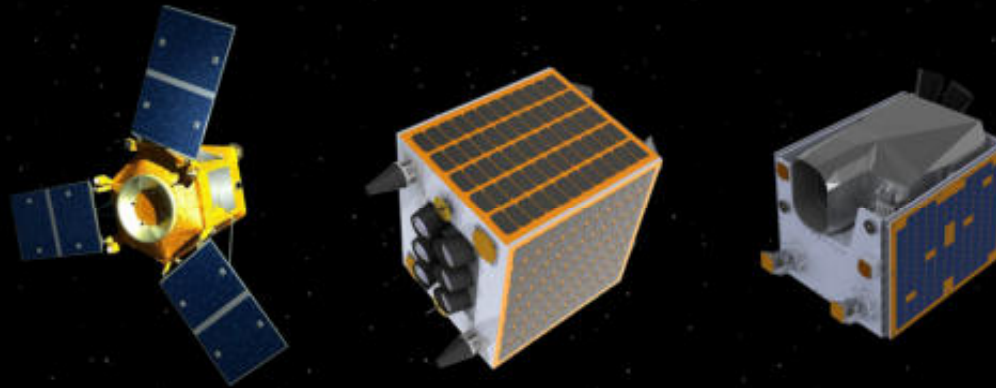


# PROJECTS

**SPACE MONITORING**



**SPACE SYSTEM OF ERS**

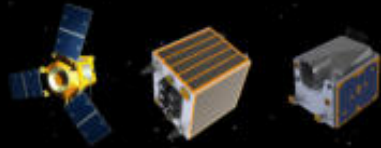


# PROJECTS

SPACE MONITORING



SPACE SYSTEM OF ERS



## HIGH-PRECISION SATELLITE NAVIGATION SYSTEM

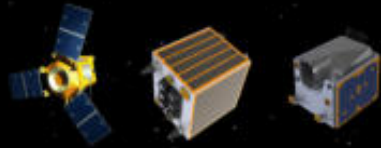


# PROJECTS

**SPACE MONITORING**



**SPACE SYSTEM OF ERS**



**HIGH-PRECISION SATELLITE  
NAVIGATION SYSTEM**



## ASSEMBLY AND TESTING COMPLEX



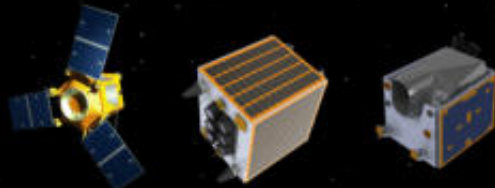


# PROJECTS

**SPACE MONITORING**



**SPACE SYSTEM OF ERS**



**HIGH-PRECISION SATELLITE  
NAVIGATION SYSTEM**



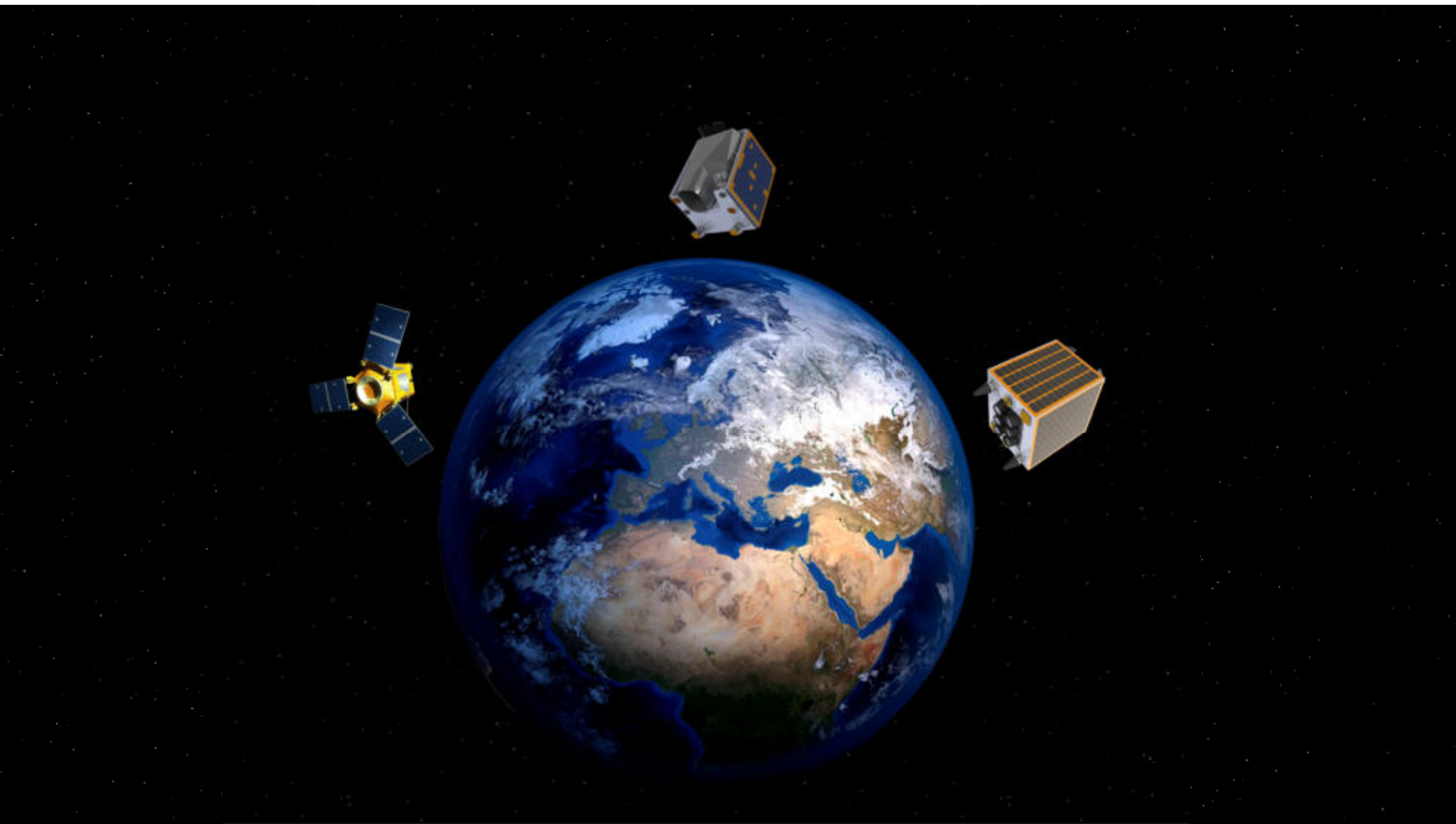
**ASSEMBLY AND TESTING COMPLEX**



# **SATELLITES**

3 ACTIVE SATELLITES AND 3 PLANNING TO LAUNCH





# KazEOSAT - 1

Developer  
Airbus Defence & Space

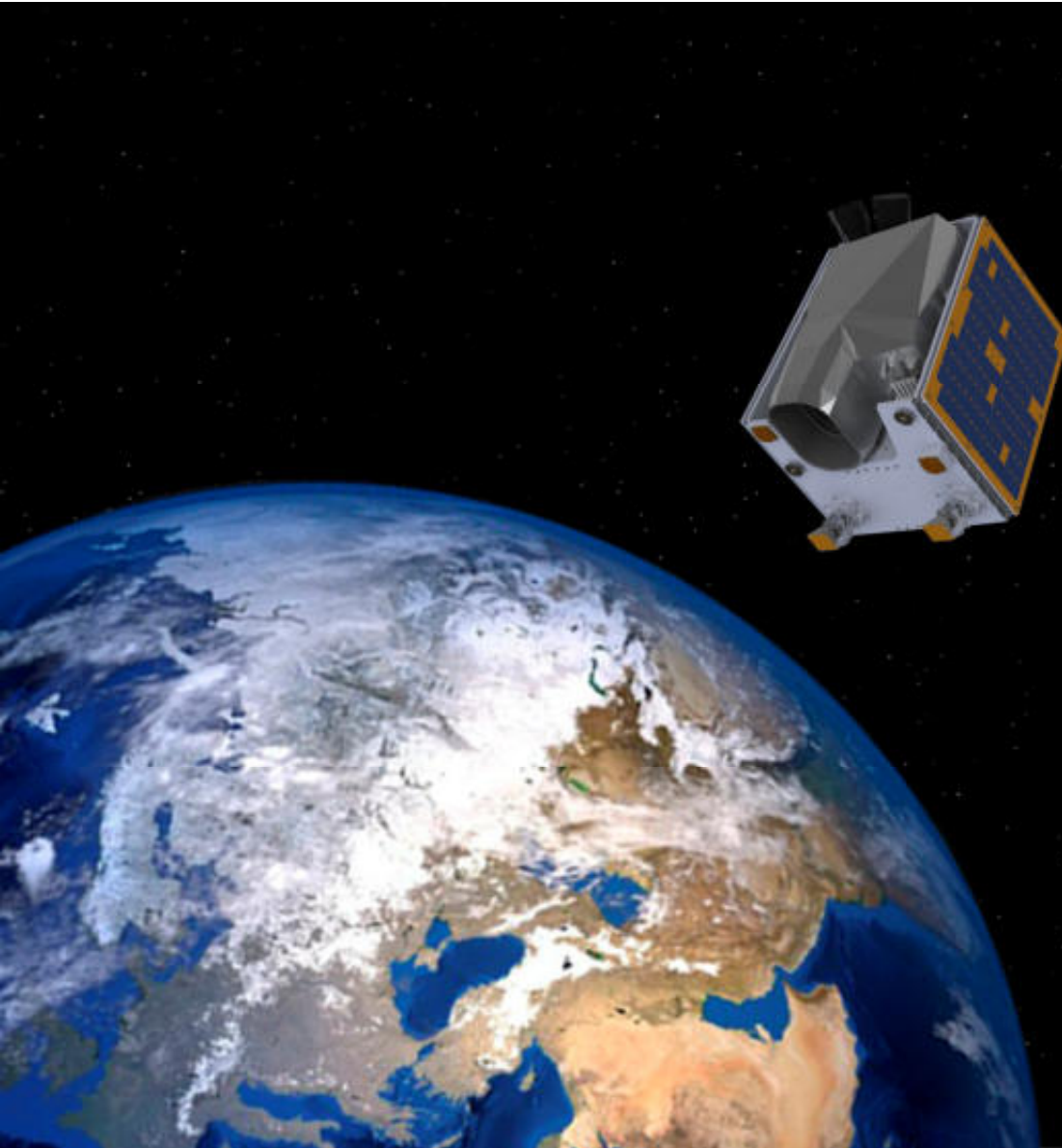
RESOLUTION: 1 m  
SPECTRAL CHANNELS: PAN, RGB  
PRODUCTIVITY PER DAY: 220 000 km<sup>2</sup>  
SHOOTING FREQUENCY: 3-5 days  
FIELD OF VIEW: 20 km



# KazEOSAT - 2

Developer  
Surrey Satellites Technology Ltd.

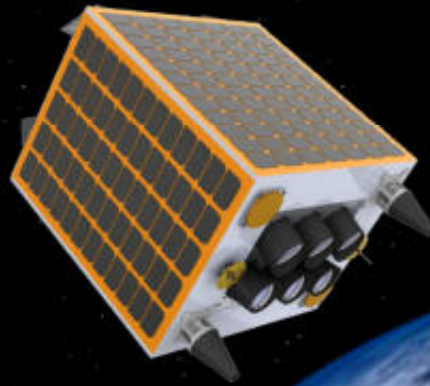
RESOLUTION: 6,5 m  
SPECTRAL CHANNELS: RGB, NIR, RED-EDGE  
PRODUCTIVITY PER DAY: 500 000 km<sup>2</sup>  
SHOOTING FREQUENCY: 5-7 days  
FIELD OF VIEW: 77 km



# KazSTSAT

Developers  
Ghalam LLP

Surrey Satellites Technology Ltd.



RESOLUTION: 17 m  
SPECTRAL CHANNELS: CB, B, G, R, RE, NIR  
PRODUCTIVITY PER DAY: 3,600.000 km<sup>2</sup>  
FIELD OF VIEW: 250 km

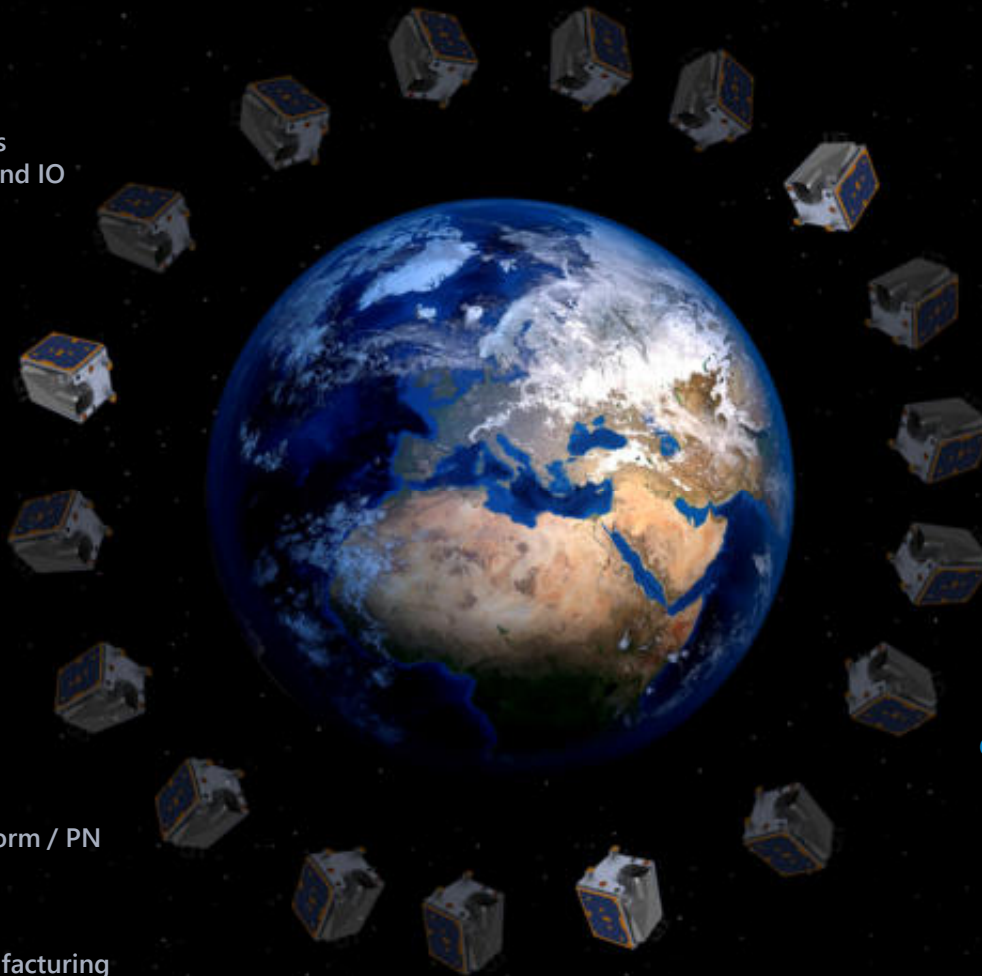


## CURRENT STATUS

- The appearance of the space system was determined based on the needs of GO and IO
- The investment proposal is undergoing economic examination

## WORKS PERFORMED ON ATCS

- System engineering
- Vibration testing of spacecraft
- Carrying out thermo-vacuum tests
- Manufacturing the mechanical structure
- 3D printing of individual elements
- EVTI production / installation
- Cable production / laying
- Conducting functional tests of the platform / PN
- Backup SCU production / redundancy
- Mounting solar cells / FEP on a panel
- Solar sensor manufacturing
- Precision mechanical components manufacturing
- Production of individual components of the SUDN
- Ground support equipment manufacturing



## SYSTEM CHARACTERISTICS

- Orbit: Sun-synchronous
- Orbit altitude: 600 km
- LTDN: 10:30
- Number of satellites: 3-18 satellites
- Performance of each satellite: not less than 1 800 thousand sq. Km per day
- Re-shooting time: once a day, anywhere
- Active life: 7 years

## USEFUL LOAD

- Capture swath: not less than 120 km (Nadir)
- Resolution: up to 5 m
- Number of channels: at least 6
- Quantization: 12 bit
- Compression: 1/2
- Dump speed: at least 300 Mbps
- Roll angle: not less than 30 degrees

# **SPACE MONITORING OF KAZAKHSTAN**

ACTIVELY CARRIED OUT OVER 40 DIRECTIONS

# SPACE MONITORING OF KAZAKHSTAN

**01 CROP MONITORING**  
COVERED: 22 million hectares,  
100% crop land for harvest

**02 FOREST MONITORING**  
COVERED: 18.6 million hectares,  
100% forest land

**03 MONITORING OF  
WATER BORDERS**  
COVERED: 3 million hectares,

**04 PASTURE MONITORING**  
COVERED: 207 million hectares,  
100% rangeland

**05 LAND USE MONITORING**  
COVERED: the whole territory  
of Kazakhstan

**06 WASTE MONITORING**  
COVERED: 33 million hectares,  
23 cities

**07 EMERGENCY MONITORING**  
COVERED: 272 million hectares,  
100% of the territory of Kazakhstan

**08 MINING MONITORING**  
COVERED: 3.6 million hectares

01

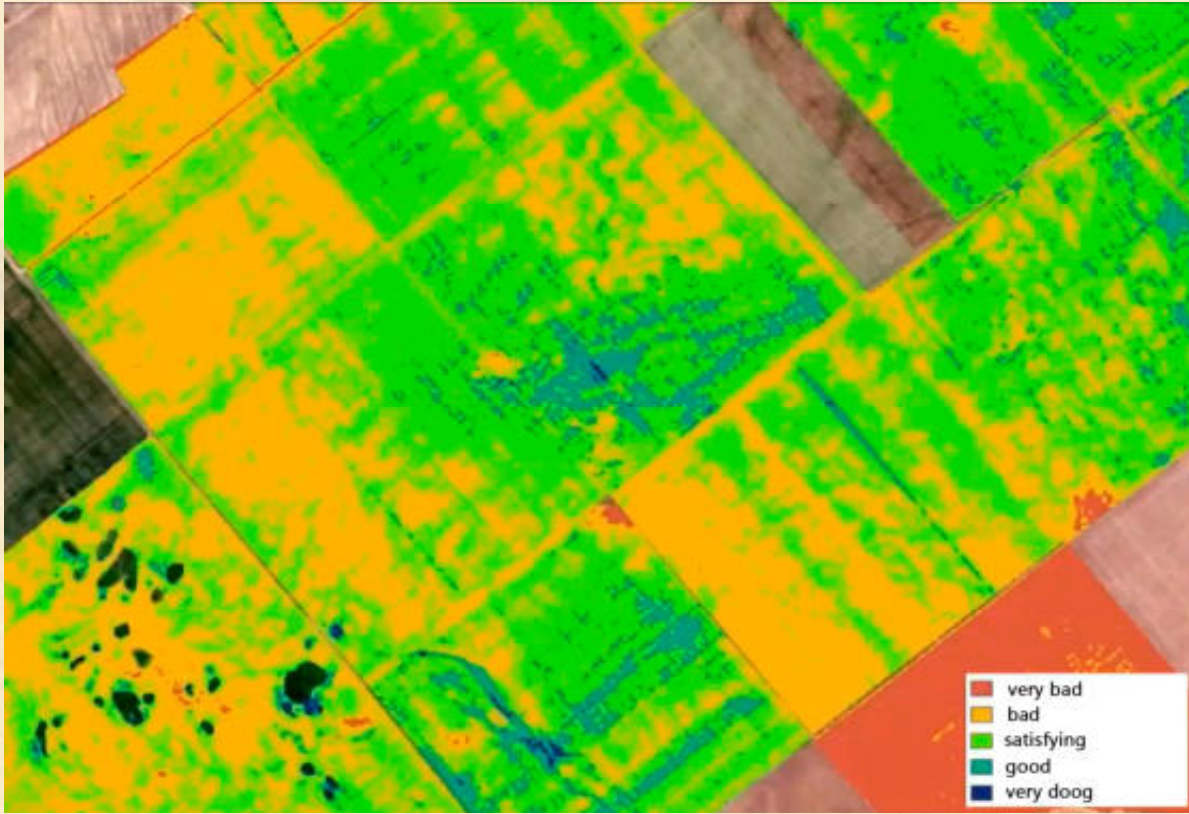
The number '01' is rendered in a large, bold font. The '0' is filled with a golden-yellow color, while the '1' is white with a golden-yellow outline. The background of the numbers is a photograph of a golden field, likely a crop field, with a red combine harvester visible in the distance.

# CROP MONITORING

COVERED: 22 million hectares,  
100% crop land for harvest



# CROP MONITORING



02

# FOREST MONITORING

COVERED: 18.6 million hectares,  
100% forest land

Satellite assessment Deforestation areas



03

# MONITORING OF WATER BORDERS

COVERED: 3 million hectares,

## Waterlogging and silting of river beds (Kyzylorda Region)



04

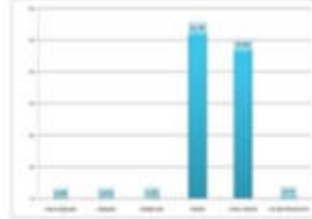
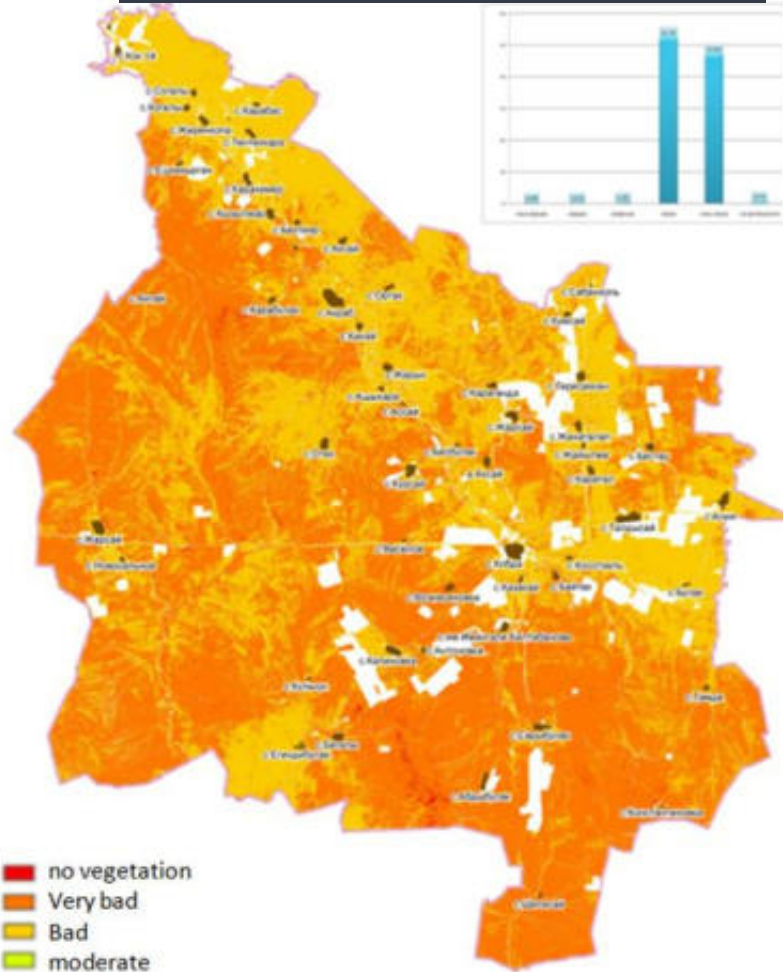
The number '04' is rendered in a large, bold font. The '0' and the top part of the '4' are filled with a vibrant green color, while the bottom part of the '4' is filled with a photograph of a green pasture with several black and white cows grazing.

# PASTURE MONITORING

COVERED: 207 million hectares,  
100% rangeland



## Condition of rangeland vegetation (summer season 2020)



- no vegetation
- Very bad
- Bad
- moderate
- Good
- Very good

1:750 000



05

# LAND USE MONITORING

COVERED: the whole territory  
of Kazakhstan



Earth remote sensing data

Geodatabase

Cadastral data

Land registers

Sowing availability: sowing  
Cadastral number: 010-154-258-654  
Land user: KH "Alma"  
Land category: Agricultural destination  
Field: agricultural land  
Status: **in use**

Sowing availability: fallow  
Cadastral number: 010-154-258-654  
Land user: KH "Taranovsky"  
Land category: Agricultural destination  
Field: agricultural land  
Status: **not used**

06

The number '06' is rendered in a large, bold, white font. The interior of the '0' and '6' is filled with a photograph of a landfill site, showing a yellow excavator working on a pile of waste.

# WASTE MONITORING

COVERED: 33 million hectares,  
23 cities



Border overrun

Authorized border

Authorized landfills

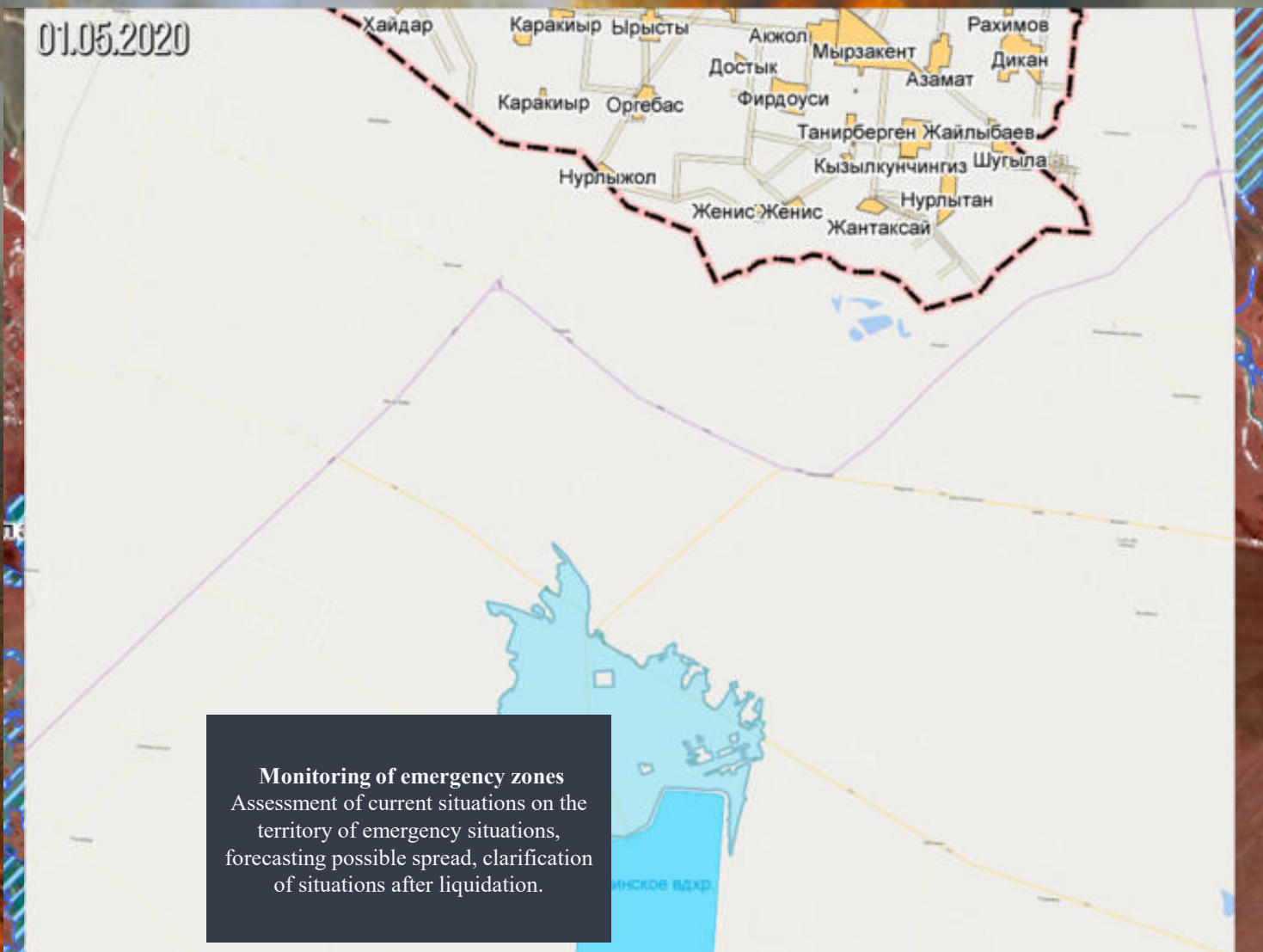
Illegal dumping

07

# EMERGENCY MONITORING

COVERED: 272 million hectares,  
100% of the territory of Kazakhstan

01.05.2020

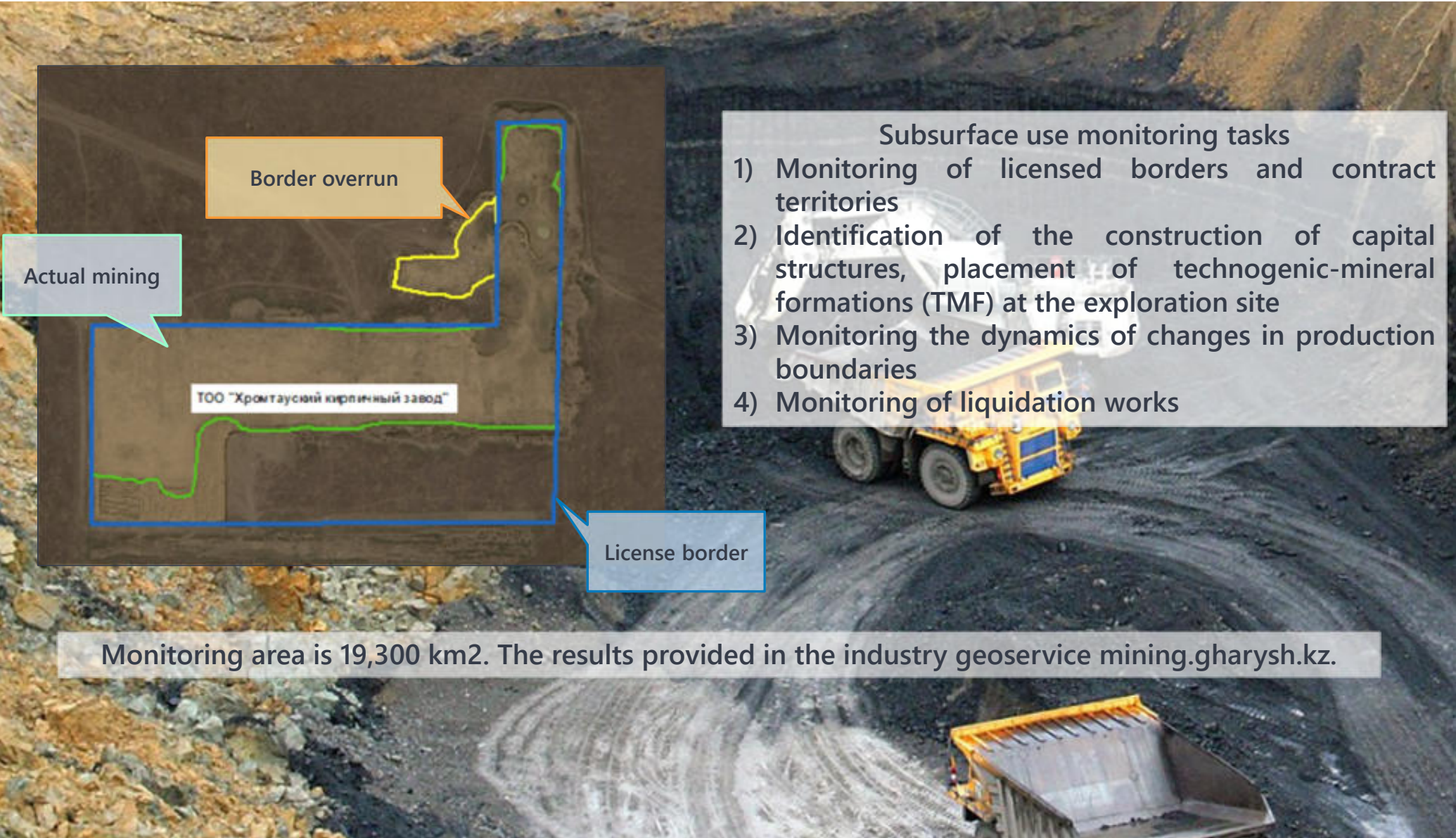


**Monitoring of emergency zones**  
Assessment of current situations on the territory of emergency situations, forecasting possible spread, clarification of situations after liquidation.

08

# SUBSURFACE USE MONITORING

COVERED: 3.6 million hectares



### Subsurface use monitoring tasks

- 1) Monitoring of licensed borders and contract territories
- 2) Identification of the construction of capital structures, placement of technogenic-mineral formations (TMF) at the exploration site
- 3) Monitoring the dynamics of changes in production boundaries
- 4) Monitoring of liquidation works

Monitoring area is 19,300 km<sup>2</sup>. The results provided in the industry geoservice [mining.gharysh.kz](http://mining.gharysh.kz).

# **GULNARA BISSENALINA**

HEAD OF INTERACTION DIVISION OF THE EARTH REMOTE SENSING  
SPACE SYSTEM DEPARTMENT

JSC «NC «KAZAKHSTAN GHARYSH SAPARY»

EMAIL: [G.BISSENALINA@GHARYSH.KZ](mailto:G.BISSENALINA@GHARYSH.KZ)

TEL.: +7(7172) 248 853