

IAEA-TM, 23-25 April, 2008 , Notwil, Switzerland

Deep Geological Disposal of High Level Radioactive Waste in China

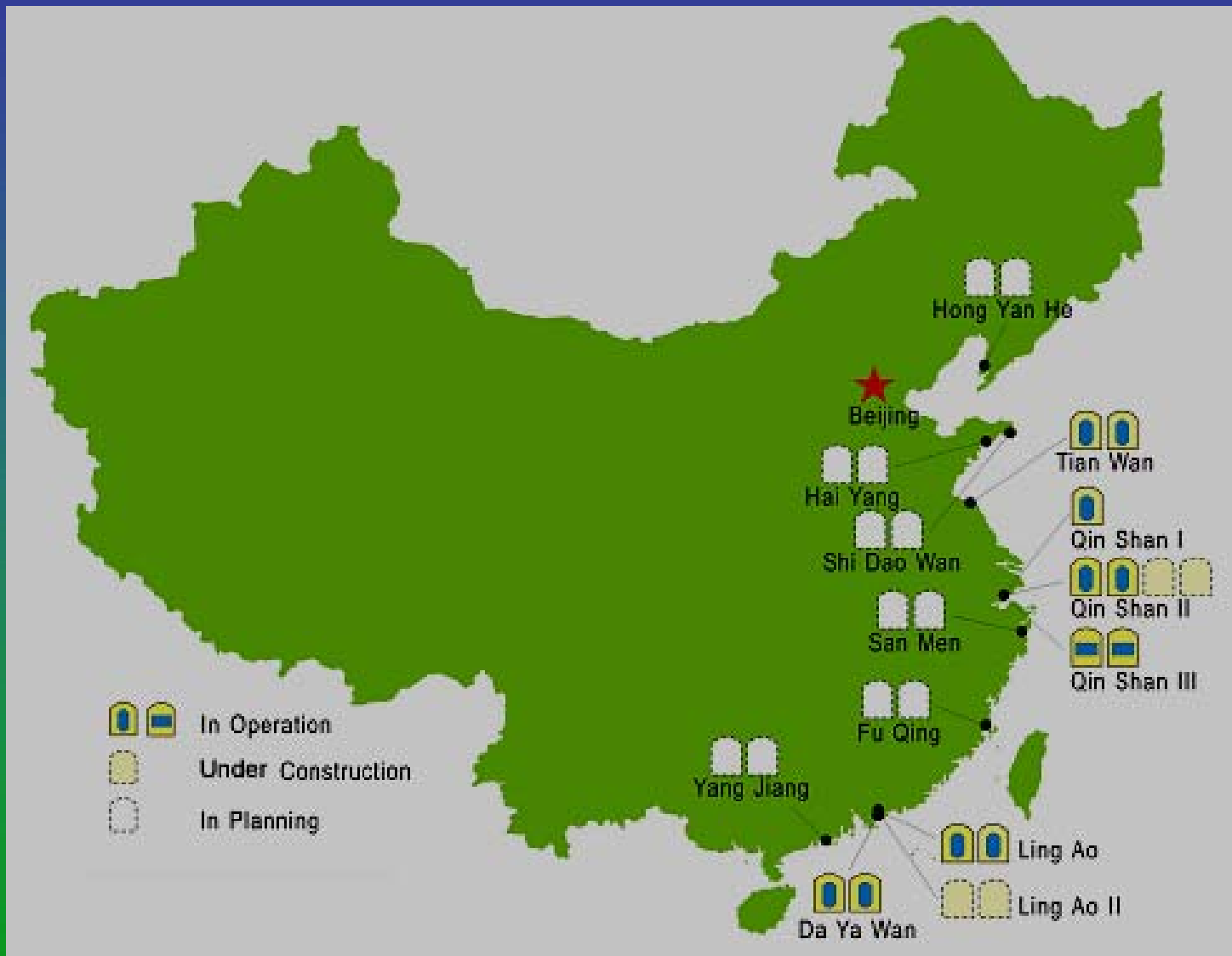
Update 2008



WANG Ju 王驹
Beijing Research Institute of Uranium Geology

中国核工业集团公司 **China National Nuclear Corporation (CNNC)**

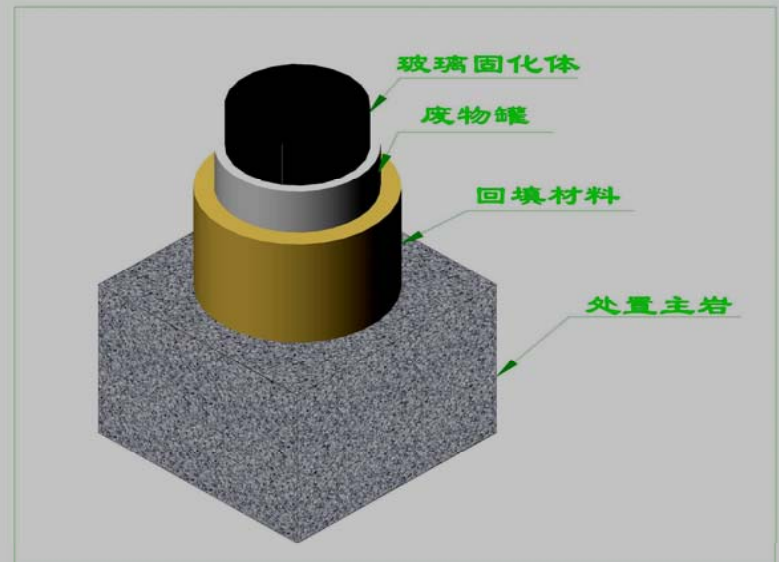
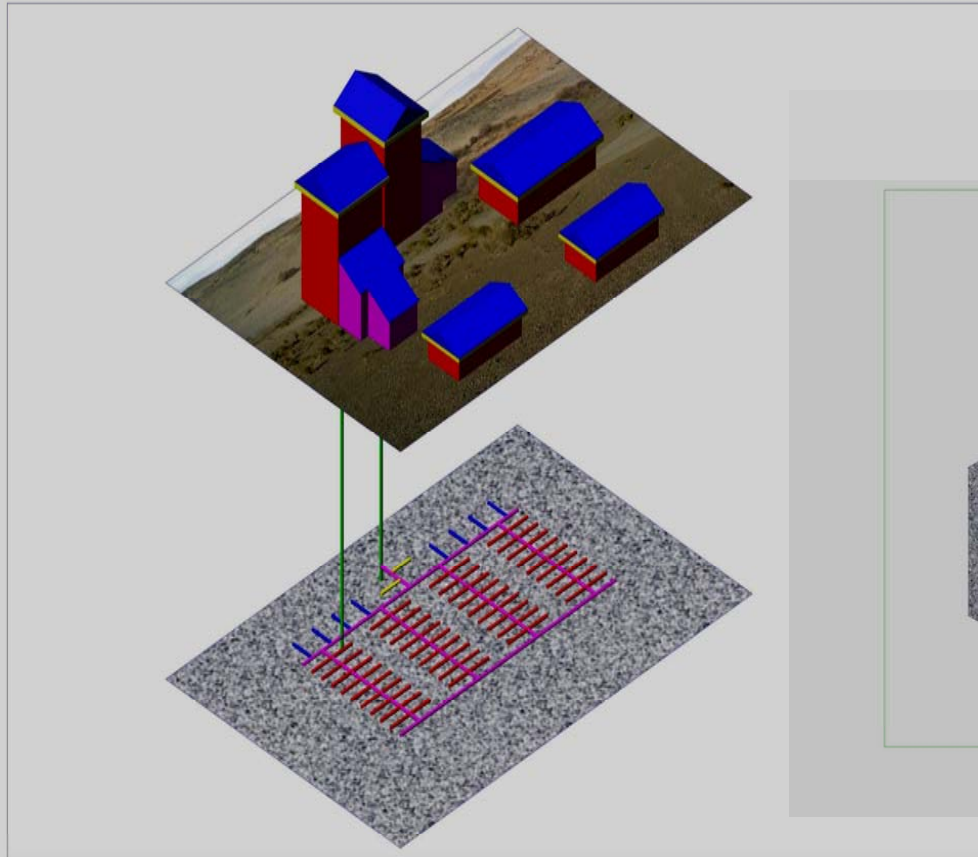
Locations of Nuclear Power Plant



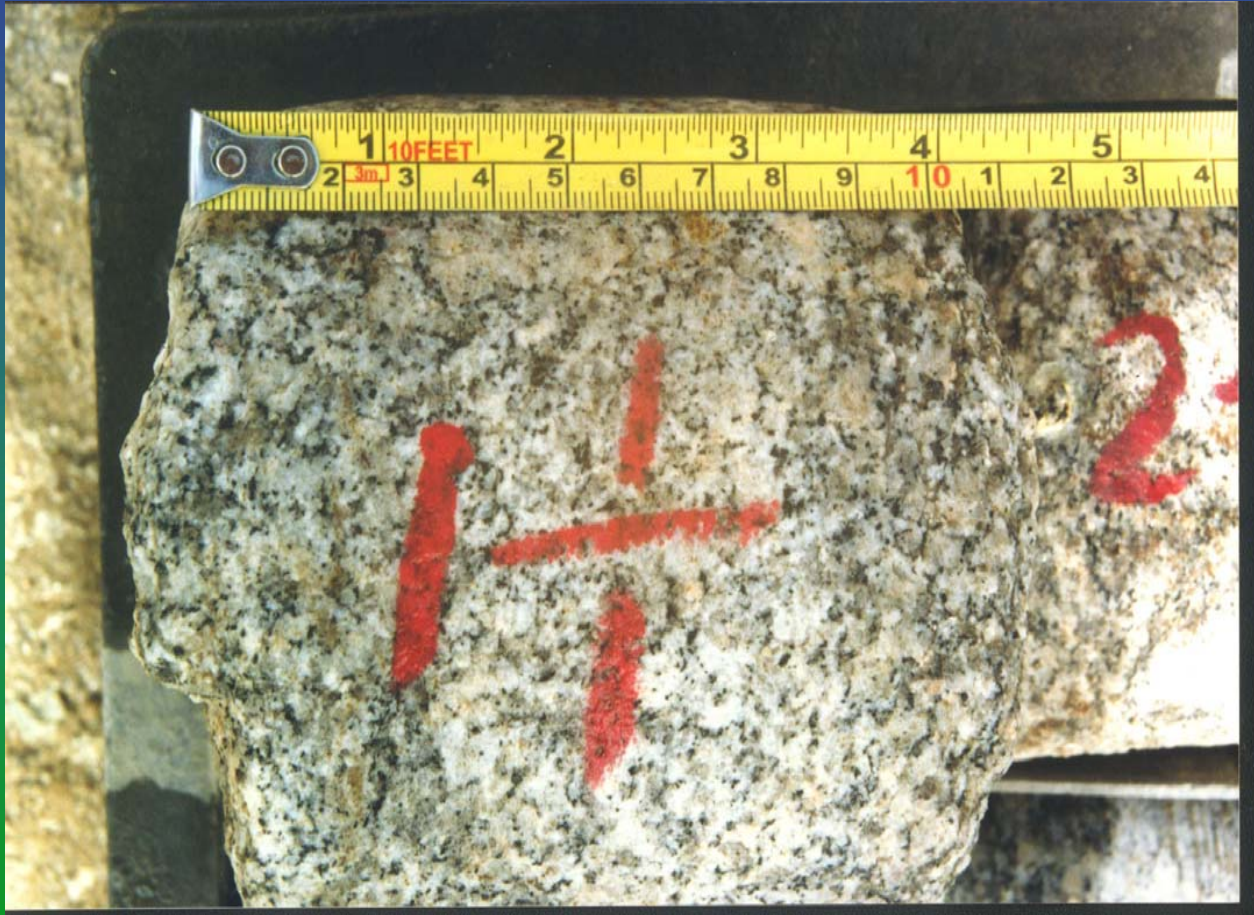
- **Installed capacity of NPP:**
 - 40 GW in operation
 - 18 GW under construction
- **30 more 1000 MW NPPs will be built in Chinese Main Land, even more !!!**
- **Cost: 60 billion USD**
- **Total spent fuel: 83,000 MTU**

Basic Policy for HLW Disposal

- **spent fuel should be reprocessed**
- **waste form: vitrified waste, CANDU SF**
- **deep geological repository**
- **host rock: granite**
- **repository concept: shaft--tunnel-disposal hole, located in saturated zone**



granite



国家环境保护总局
国家核安全局
Regulatory body

国家原子能机构
Project and fund control

Ministry of Environment
Protection
(MoEP)

National Nuclear
Safety Admin.
(NNSA)

China Atomic Energy
Authority
(CAEA)

China National Nuclear Corporation (CNNC)
-- possible implementation body

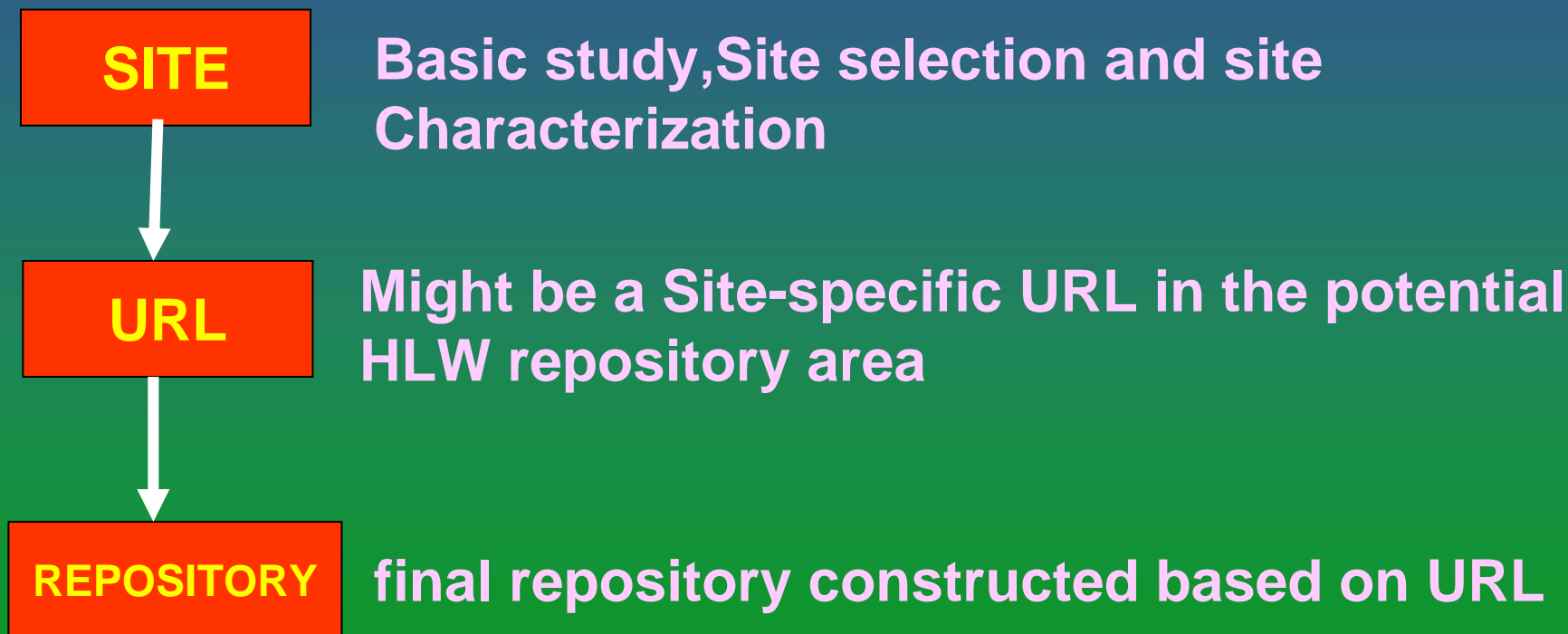
4 Leading Institutes

- **Beijing Research Institute of Uranium Geology (BRIUG):**
 - **site investigation \PA\ EBS**
- **China Institute of Atomic Energy: Radionuclide Migration**
- **China Institute for Radiation Protection: SA**
- **Beijing Institute of Nuclear Engineering: Engineering Design**

- **other institutes and Universities**

- **Feb. 2006: R&D Guidelines for Geological Disposal**
- **jointly published by China Atomic Energy Authority
Ministry of Sci&Tech., Ministry of Environ. Prot.**
- **Oct. 2007: the Long Term Development Plan for the NPP
in China (2006-2020). Approved by the State Council**
 - **The construction of an URL for HLW in China should
be completed by 2020**

3-step strategy (“三部曲”战略)



- Strategies, planning and management
- Engineering Design
- Site selection and site characterization
- Radiochemical studies for disposal
- Safety assessment

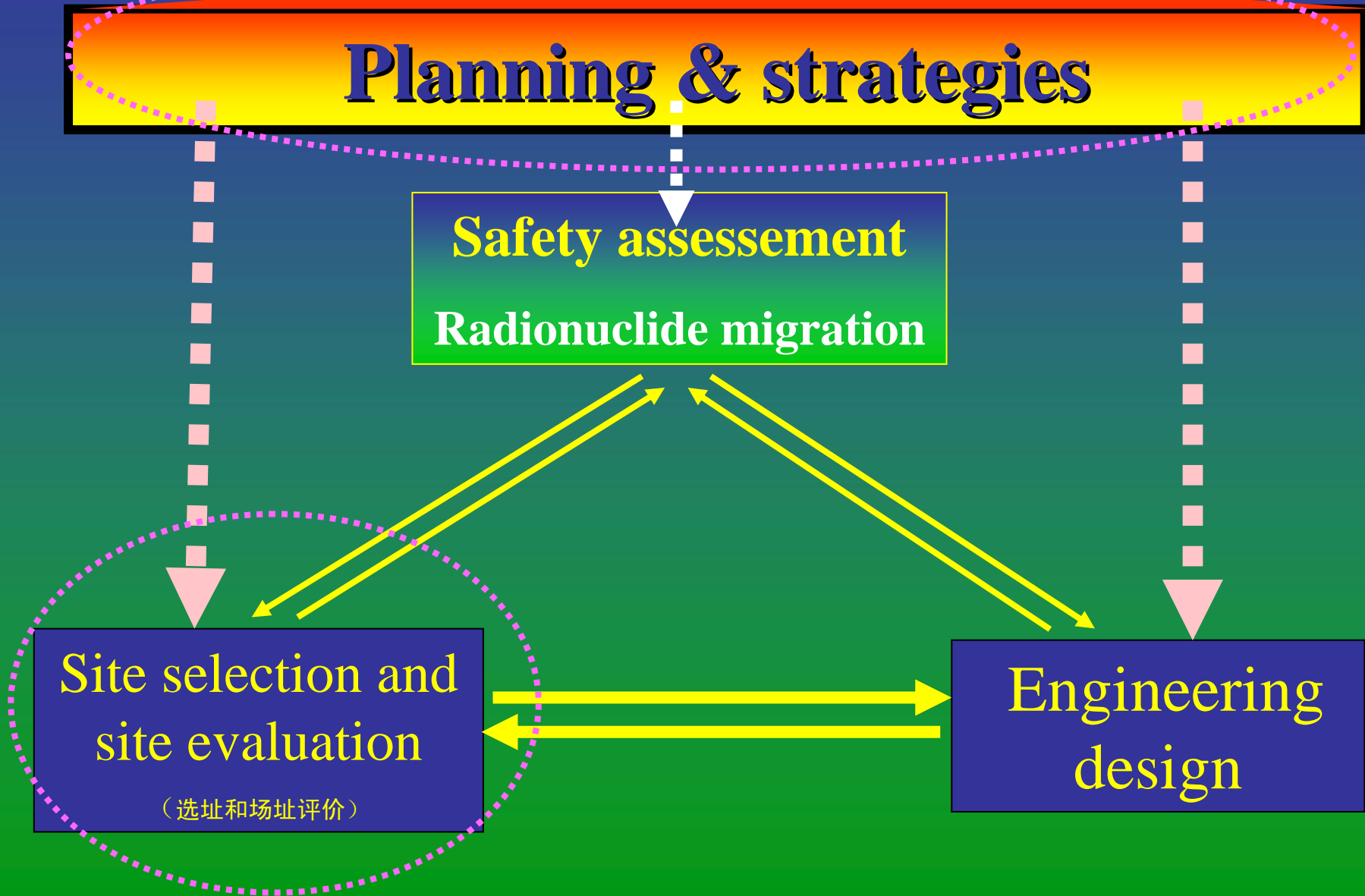
Planning & strategies

Safety assessment
Radionuclide migration

Site selection and
site evaluation

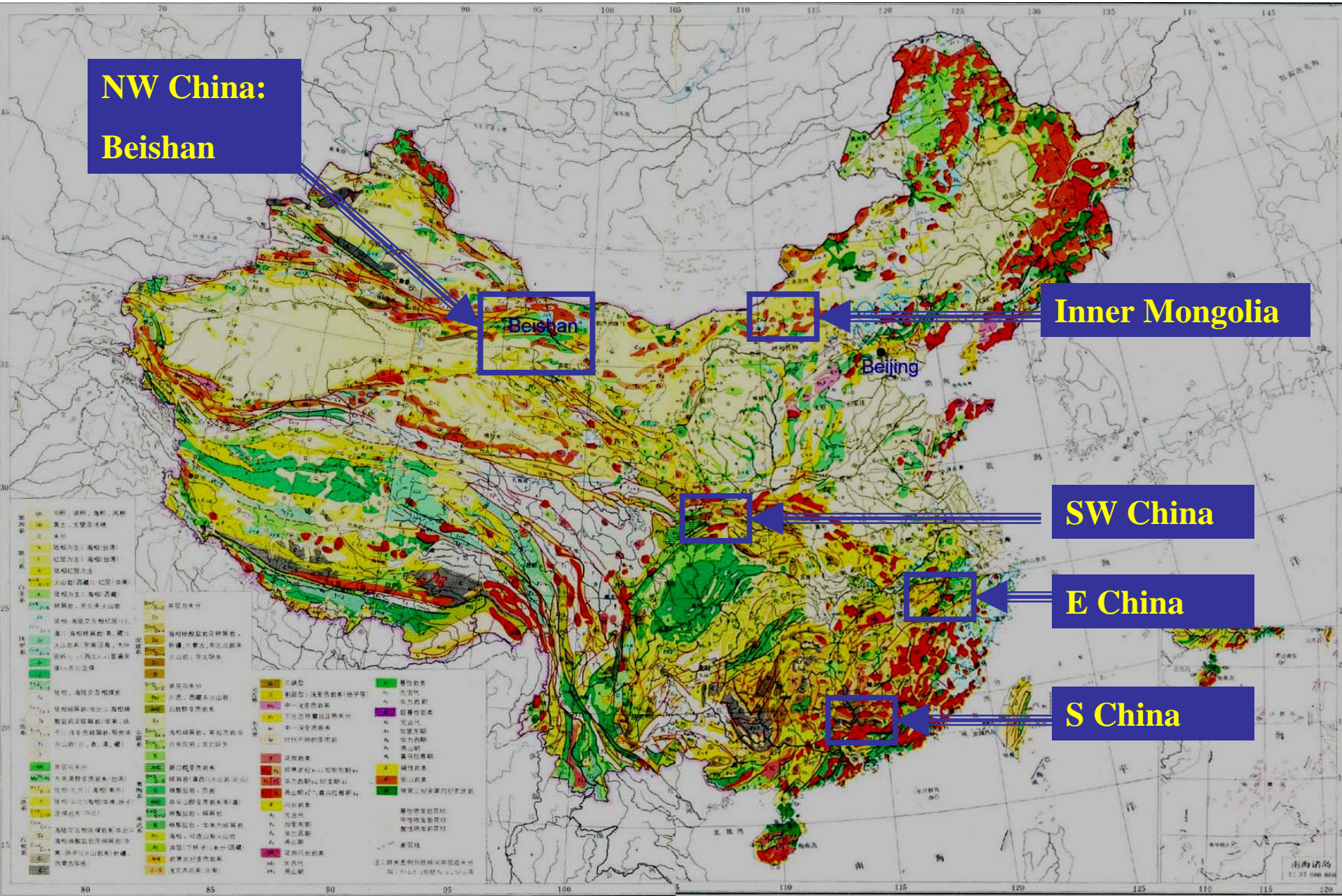
(选址和场址评价)

Engineering
design



- surface geological, hydrogeological and survey at Jiuqing, Yemaquan and Xinchang-xiangyangshan sections
- bore hole drilling:
 - BS01, 02, 03, 04,
 - BS07, 08, 09,10,11,12,13,14 ---finished in 2007
- geophysical survey
- in situ tests in bore holes

Major activities: Site selection and site characterization



5 Pre-selected regions for China's HLW repository since 1986



Landscape of Beishan site

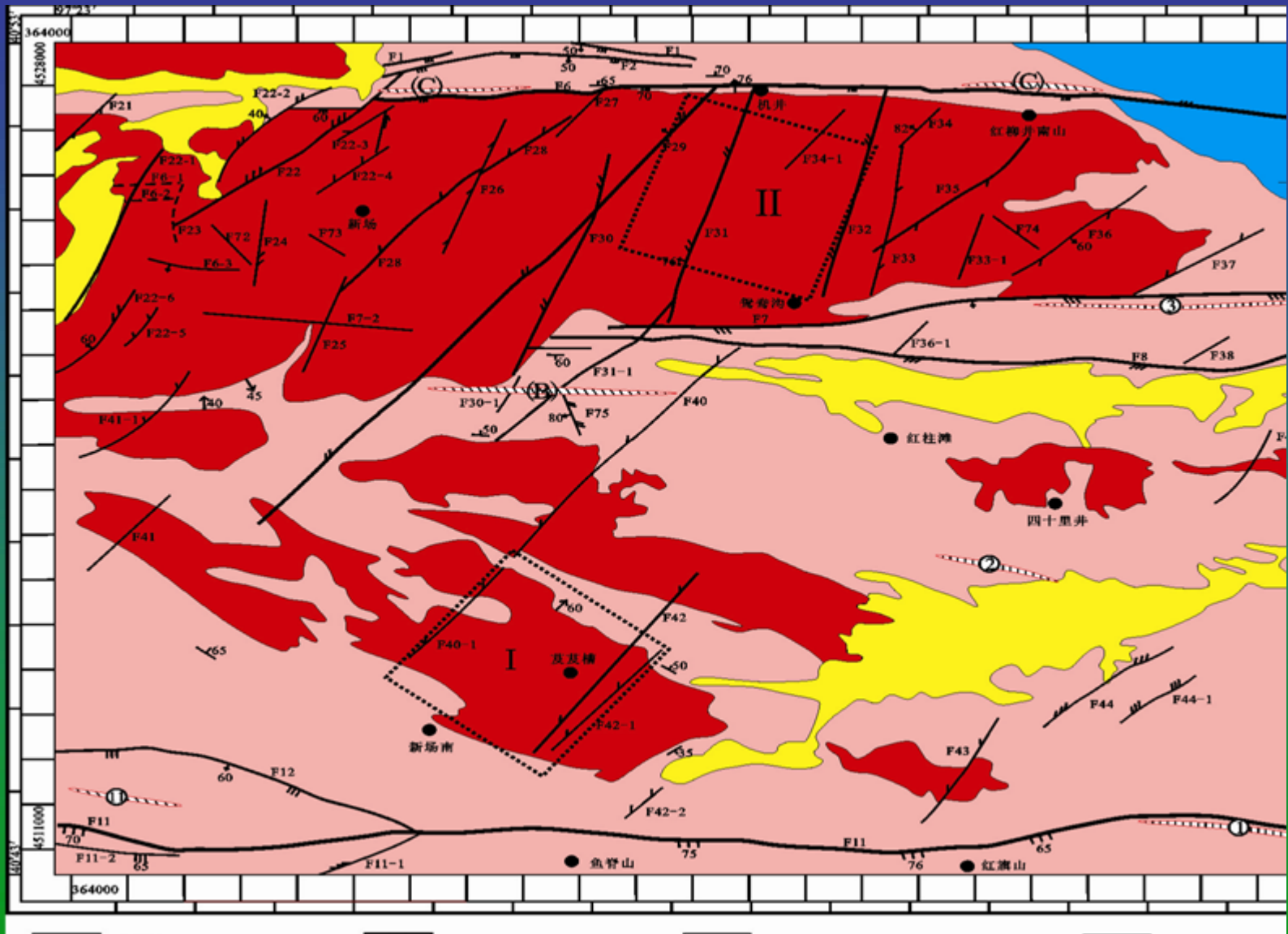
Outcrops of granite



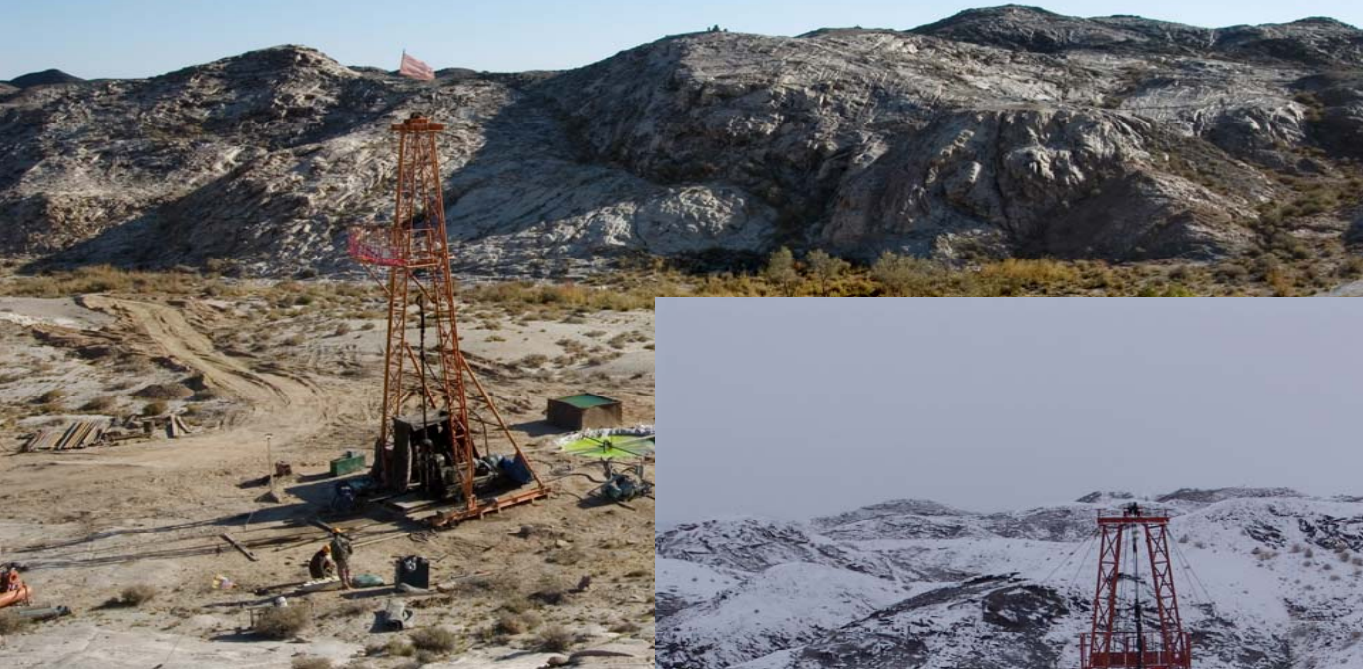
- in Gansu (甘肃) province, NW China
- the most potential area for China's repository
- Gobi desert area
- low population density
- low precipitation : 60--80 mm/a
- high evaporation: 2900-3200 mm/a
- no economical prospect
- no important mineral resources
- convenient transportation
- stable crust
- favorable hydrogeological conditions
- host rock: granite and diorite

- Site selection and Site characterization in Beishan
- Regional geological study
- Shallow bore hole drilling at
 - Jijicao Section: 5 bore holes
 - Xinchang Section: 3 bore holes

Geological map of Xinchang section 新场地段地质图

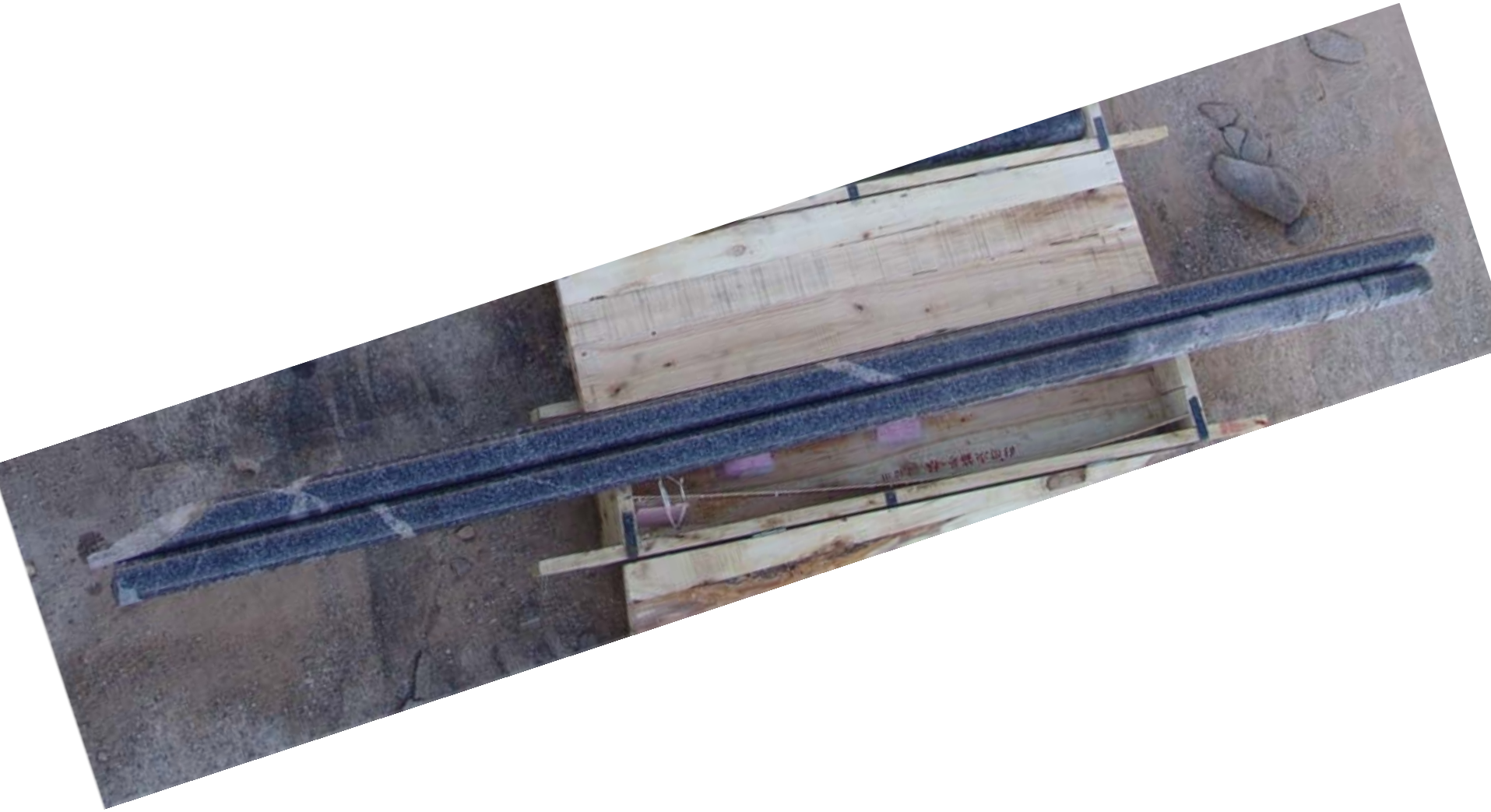


BS12



BS13





BS03

BS01

BS02

BS04

北

山

8 shallow bore holes

旧井 Jiujing

野马泉
yemaquan

向阳山-新场
xiangyangshan

BS05

BS06

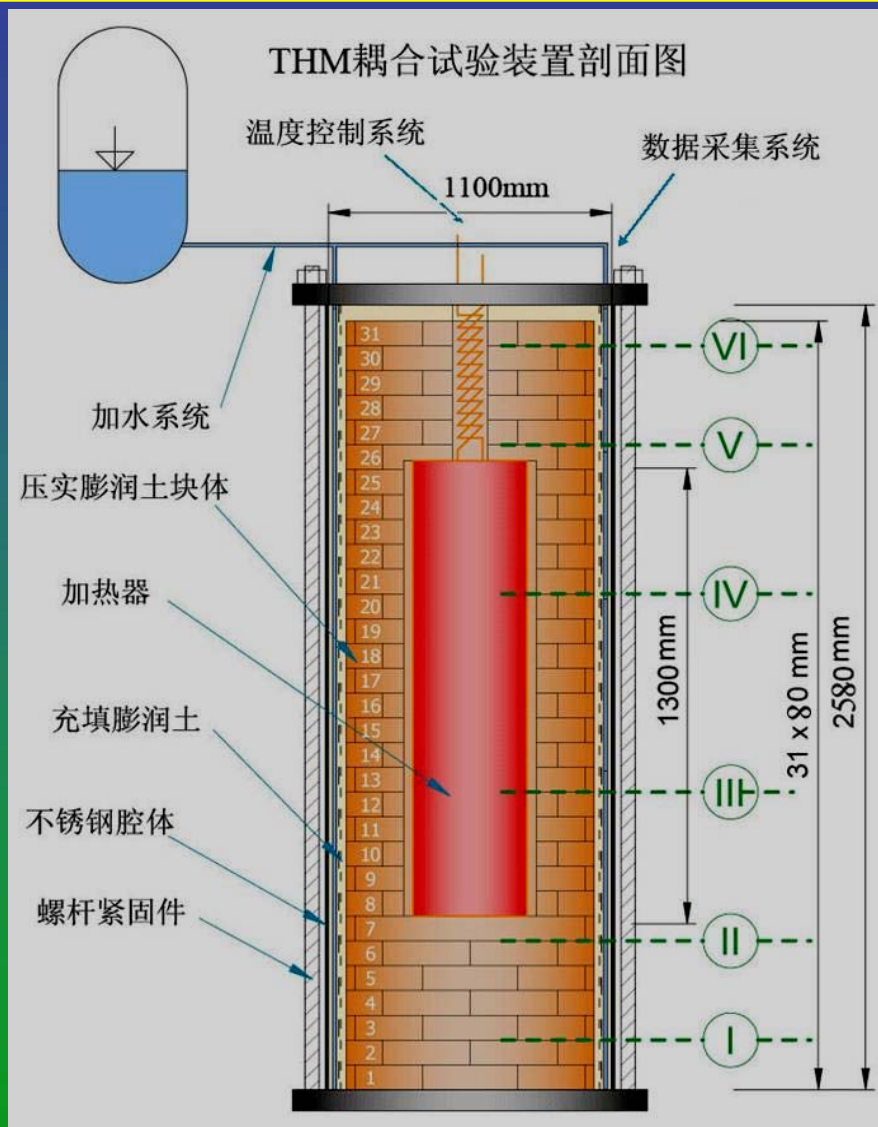
地质资料来源: 地质部甘肃省地质局第二区域地质测量队第二分队
1965-1967年测制, 1968年11月本队验收, 1969
年地质部出版, 地质部地质三厂印刷。

比例尺: 1:100000
地质部地质研究所编, 地质部地质三厂印刷。

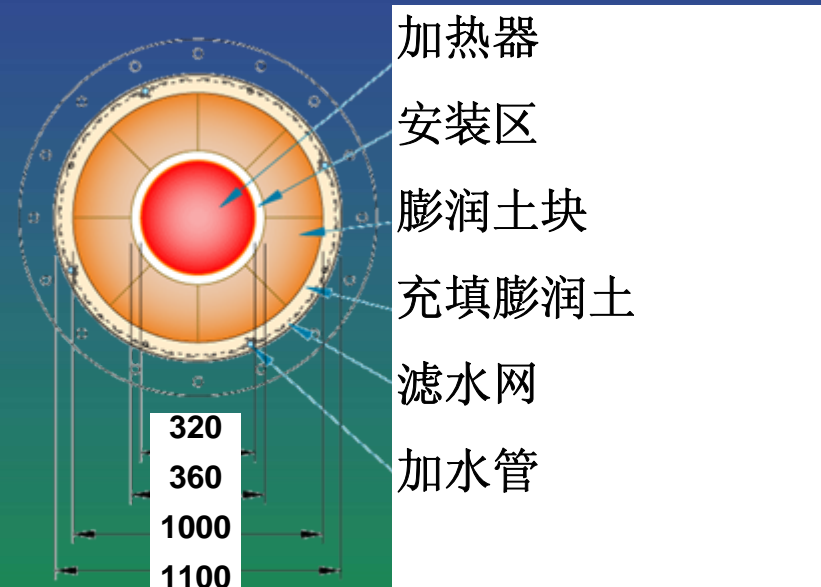
Bore holes in Beishan site

120 Million Tone, Na-bentonite

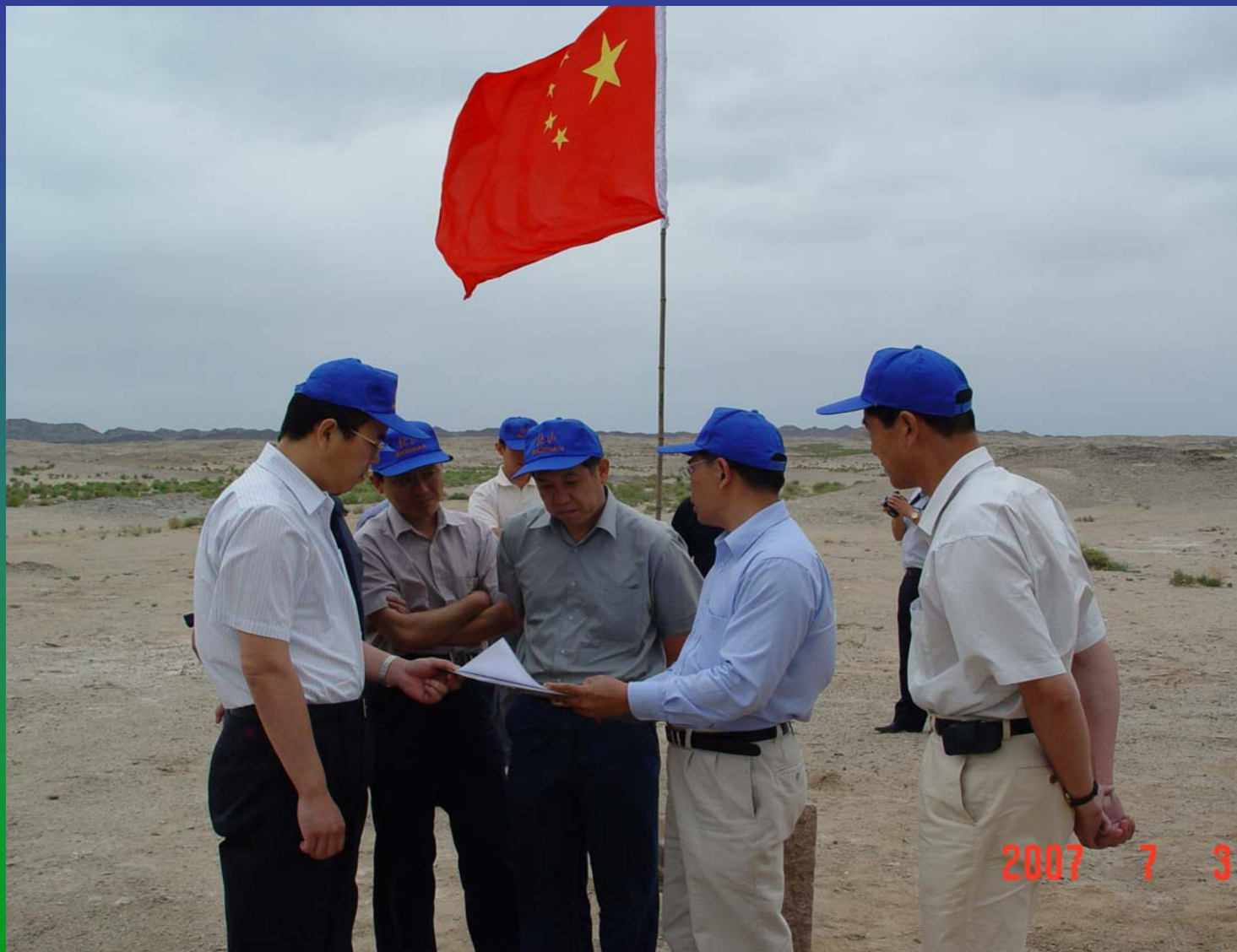


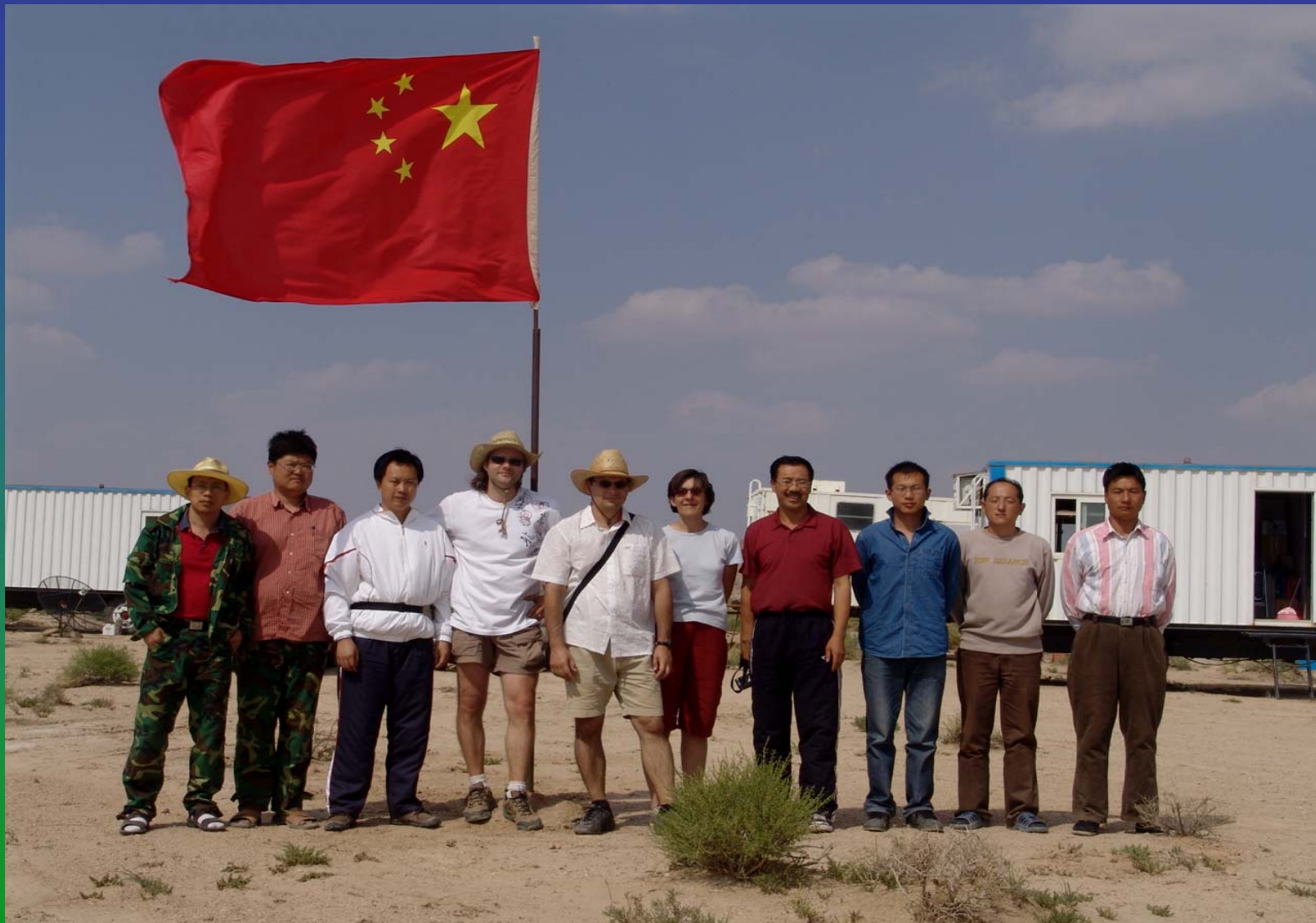


THM耦合试验装置水平剖面图



This test is open for international cooperation







中德放射性废物处置研讨会
CHINESE-GERMAN WORKSHOP ON RADIOACTIVE WASTE DISPOSAL
May 28-31, 2007, Beijing, China



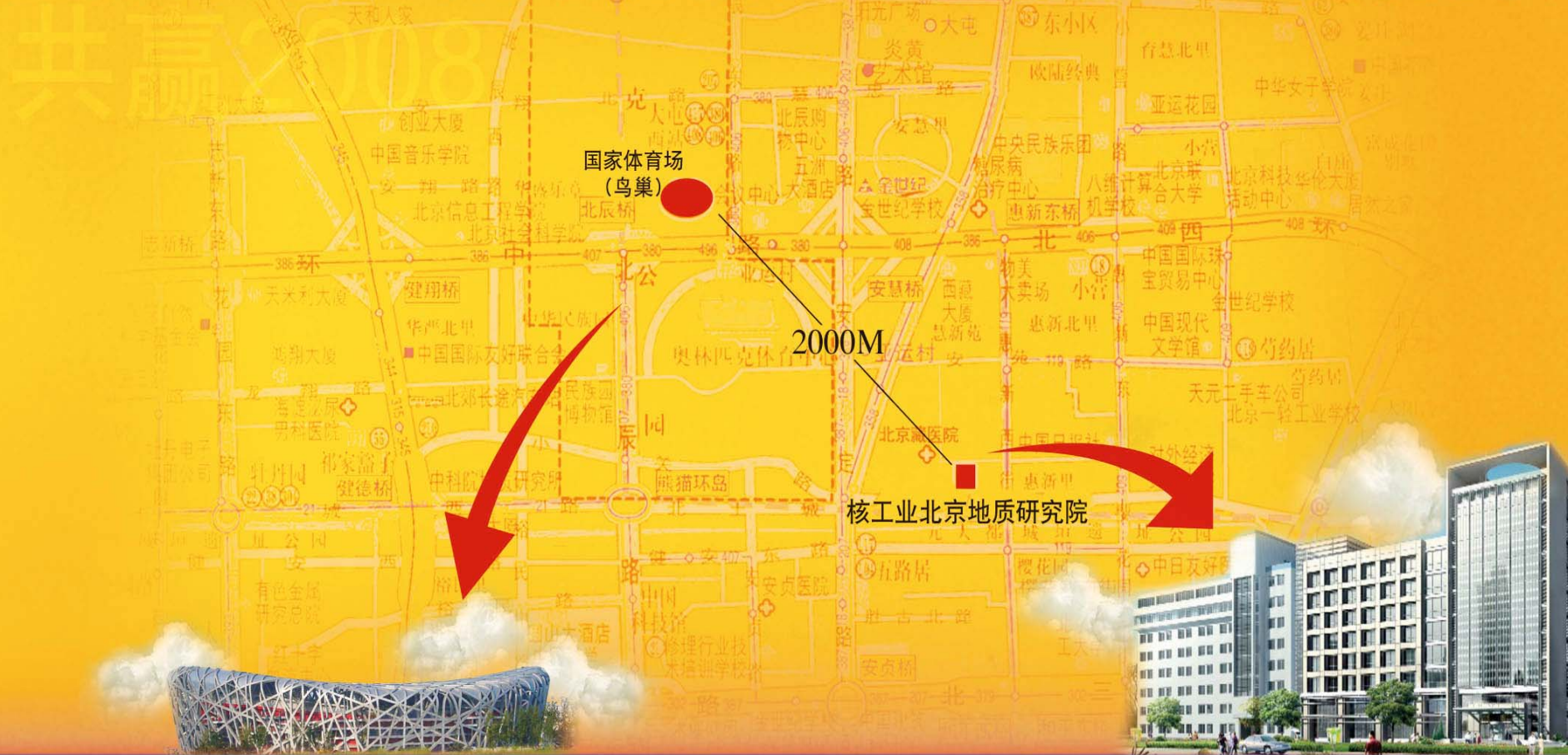
中德科学中心，中国，北京

Beautiful double Rainbow in Beishan



谢谢

BEIJING RESEARCH INSTITUTE OF URANIUM GEOLOGY



第29届夏季奥运会的圣火于2008年8月8日在北京国家体育场点燃

核工业北京地质研究院新建科研实验楼于2008年8月18日竣工

乘奥运之光，与奥运同行。我们秉承更快、更高、更强，不断进取、永不满足的奥运精神，认真落实科学发展观，不断提高科技创新和科技管理能力，努力打造铀资源评价、遥感技术与应用、核废地质处置研究三大科研品牌，向具有一流人才、一流技术、一流成果和具有国际竞争能力一流的研究院目标迈进。



福娃 Fuwa



福娃贝贝
Beibei



福娃晶晶
Jingjing



福娃欢欢
Huanhuan



福娃迎迎
Yingying



福娃妮妮
Nini