Environmental Monitoring of the construction works for the Torino 2006 Winter Olympic Games

AGENZIA TORINO 2006

Agenzia per lo svolgimento dei XX Giochi Olimpici Invernali "Torino 2006"

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Overview

- Geographic context
- Type of facilities
- Objectives of the monitoring
- Methodology
- Organisation
- Results

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Geographical context

Bob Sleigh Stadium

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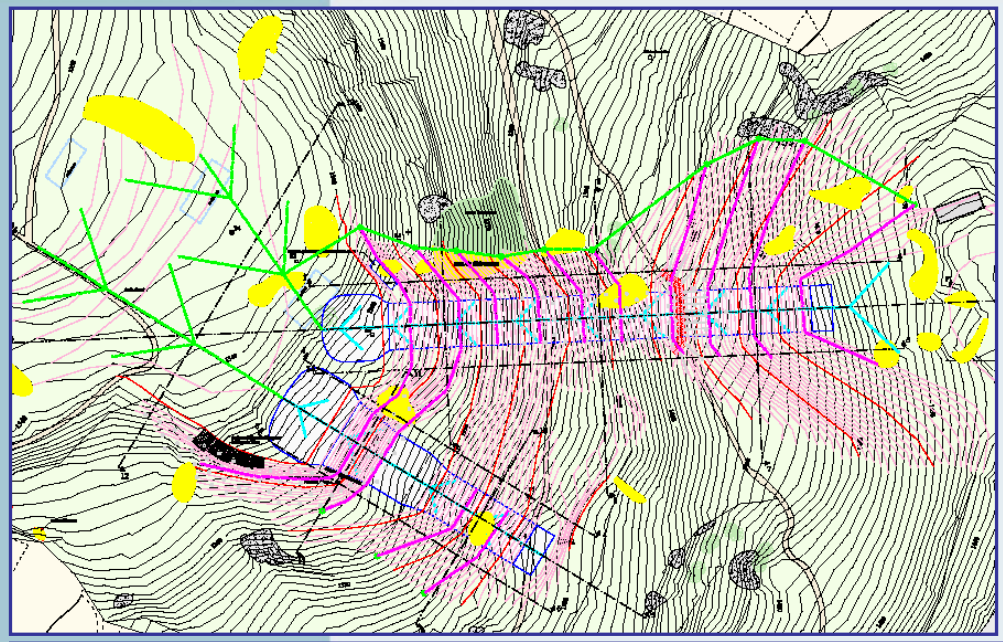
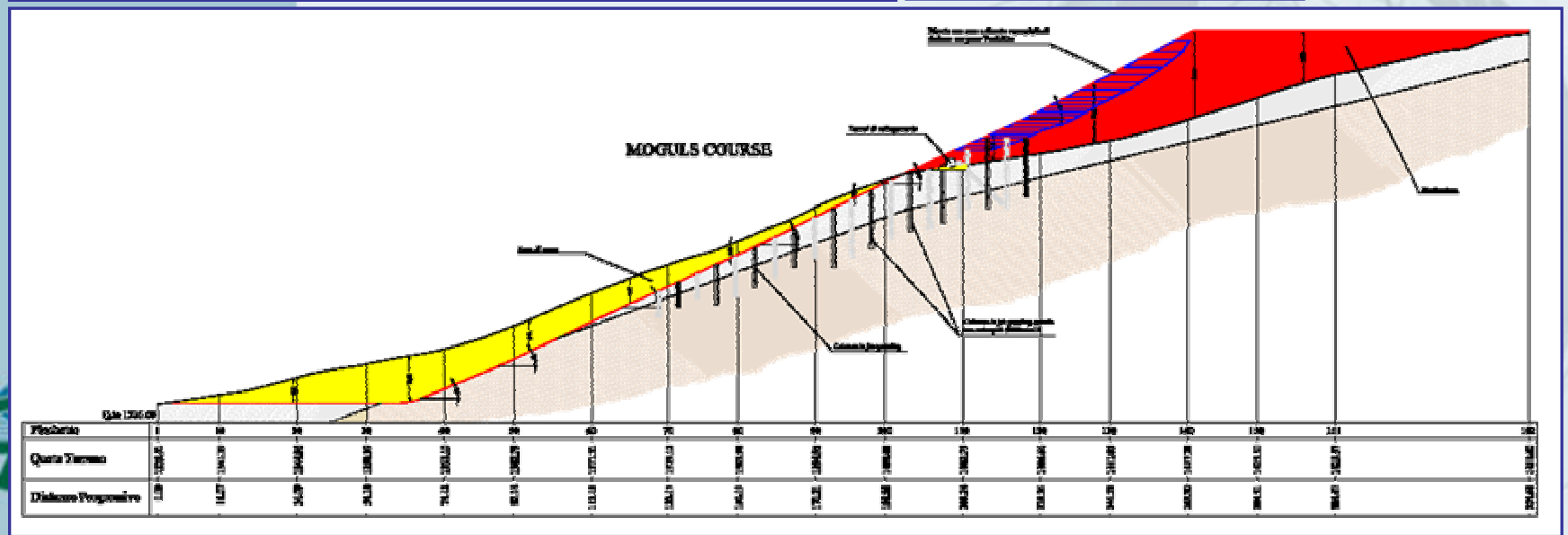
Freestyle Stadium





Freestyle Stadium

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Skate Stadium

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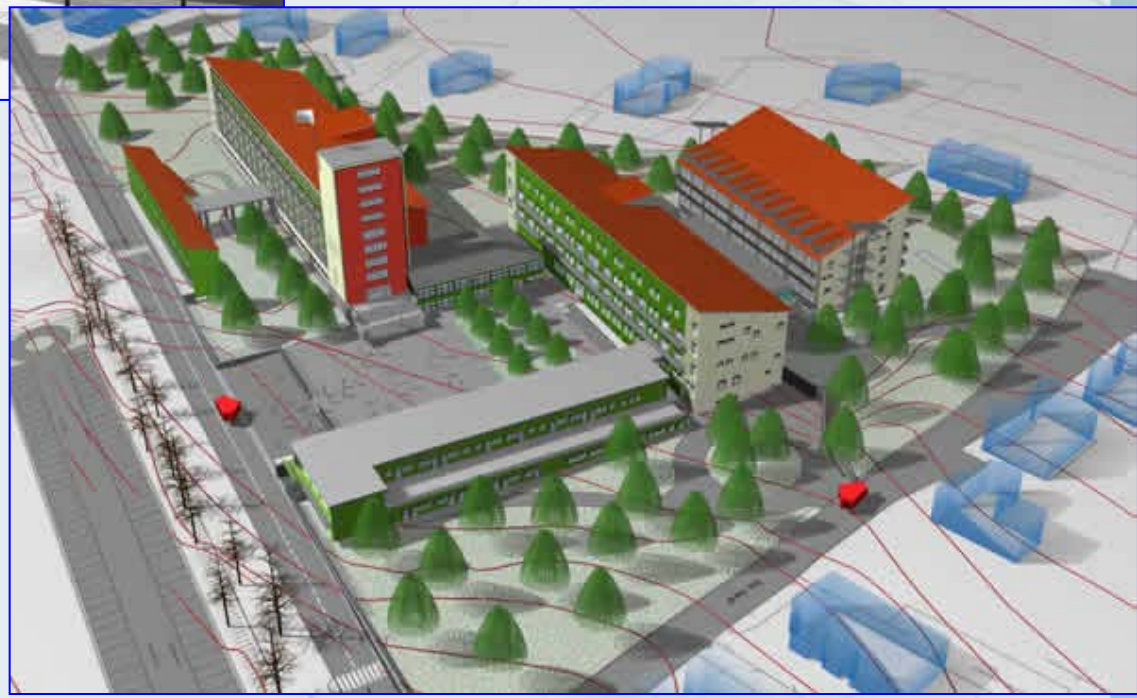
Olympic Village: Colonia Medail



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Ski lifts - Chair lifts

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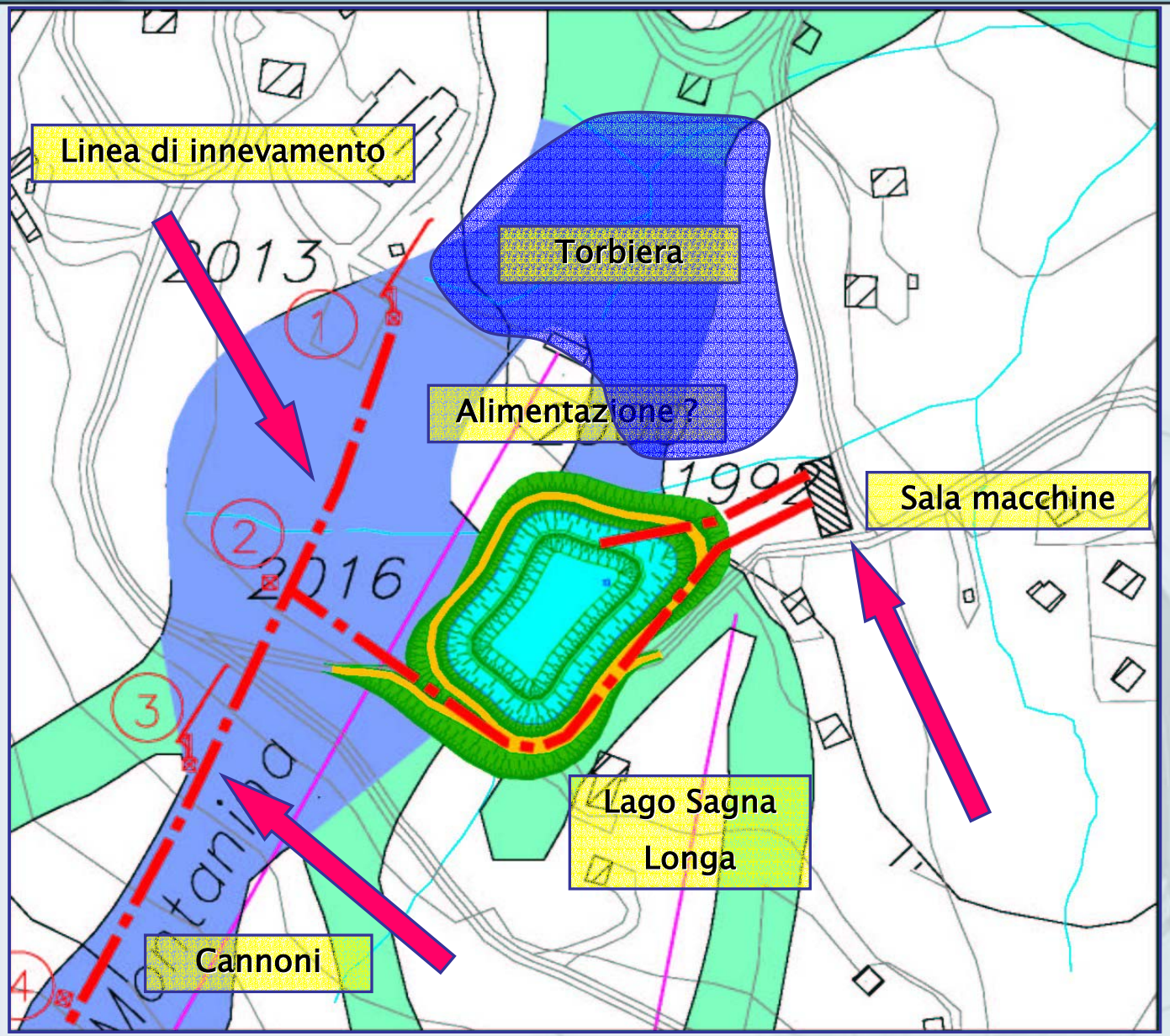
Reservoirs


Linea di innevamento
Torbiera
Alimentazione ?
Sala macchine
Lago Sagna
Longa
Cannoni
2013
2016
1902
1
2
3
4

Reservoirs

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Construction

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Specific problems

- Facilities located in areas with high ecological value, and within or beside protected areas.
- Facilities located very close to permanently or temporarily inhabited areas.
- Various types of facilities:
  - Buildings – demolition works
  - Special infrastructures
  - Hydraulic works (storage, drainage)
  - Roads improvement
- High number of facilities (ab. 35)

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Specific problems

- Many construction works in the same location in different times or contemporarily.
- Works undertaken by different contractors and supervised by different engineering firms.
- Permitting activities conducted separately for each facility – difficulties in assessing the cumulative impacts.
- Short seasons – high seasonality in the construction activities.
- Asbestos containing rocks in part of the construction area.

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Objectives of the monitoring program

- Ensure compliance during construction.
- Assess the cumulative effects due to construction works insisting on the same receptors.
- Optimize the monitoring activities, reducing redundancy.
- Only one entity collecting data in the field and one independent entity validating the data.
- Present the data to the relevant authorities in a coordinated way.
- Timely and effective feedback and counter measures in case of non compliance.

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Methodology

- Analysis of existing documents:
  - Planning documents (Strategic Environmental Assessment, Olympic Program, etc.)
  - Design documents
  - Permitting documents
  - Environmental reports
  - Maps and aerial pictures

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Methodology

- Definition of 6 monitoring areas
  - Area 1 – Cesana T.se, Sagna Longa e Claviere
  - Area 2 – Sestriere
  - Area 3 – Pragelato
  - Area 4 – Oulx e Sauze d'Oulx
  - Area 5 – Cesana T.se e San Sicario
  - Area 6 - Bardonecchia

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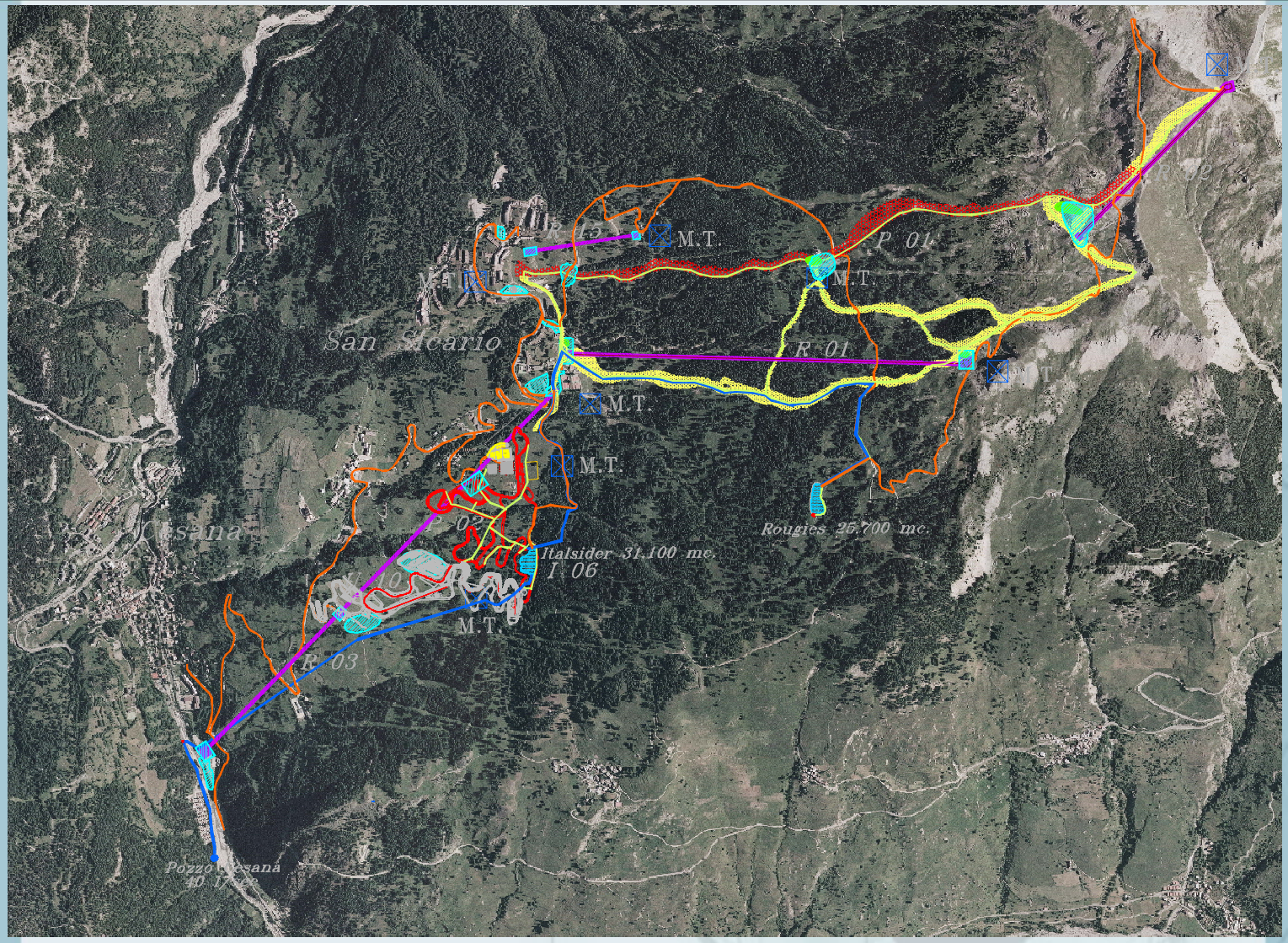
Methodology

All the projects included in each area have been coordinated and the layout put on aerial pictures at 1:5000 scale.



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Methodology

- The projects have been categorized according to the specific construction methodologies and therefore action with a potential impact.
  - Ski lifts Chair lifts
  - Snow making facilities
  - Competition grounds
  - Olympic villages
  - Roads

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Methodology

- For each environmental component a series of indicator has been identified

AIR

- Total suspended particles (PTS) and <10 um suspended particles (PM10)
- Dust deposition
- Suspended asbestos fibres
- Indicators related to traffic (NO_x, SO_2, VOCs, etc.)

NOISE

- Noise generated by traffic
- Noise generated by construction activities

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Methodology

VIBRATIONS

- Vibrations generated by the traffic
- Vibrations generated by the construction activities

SURFACE WATER

- Hydrological, chemical and biological indicators

GROUND WATER

- Hydrological, chemical and biological indicators

SOIL

- Physical, chemical and biological indicators

VEGETATION, WILDLIFE AND ECOSISTEMS

- Quantitative censuses for target species (Red deer, Chamois, Alpine grouse, Ptarmigan, Woodpeckers)
- Screening surveys (semi-quantitative transects) on all habitat types
- Detailed surveys (quantitative transects) on wetlands

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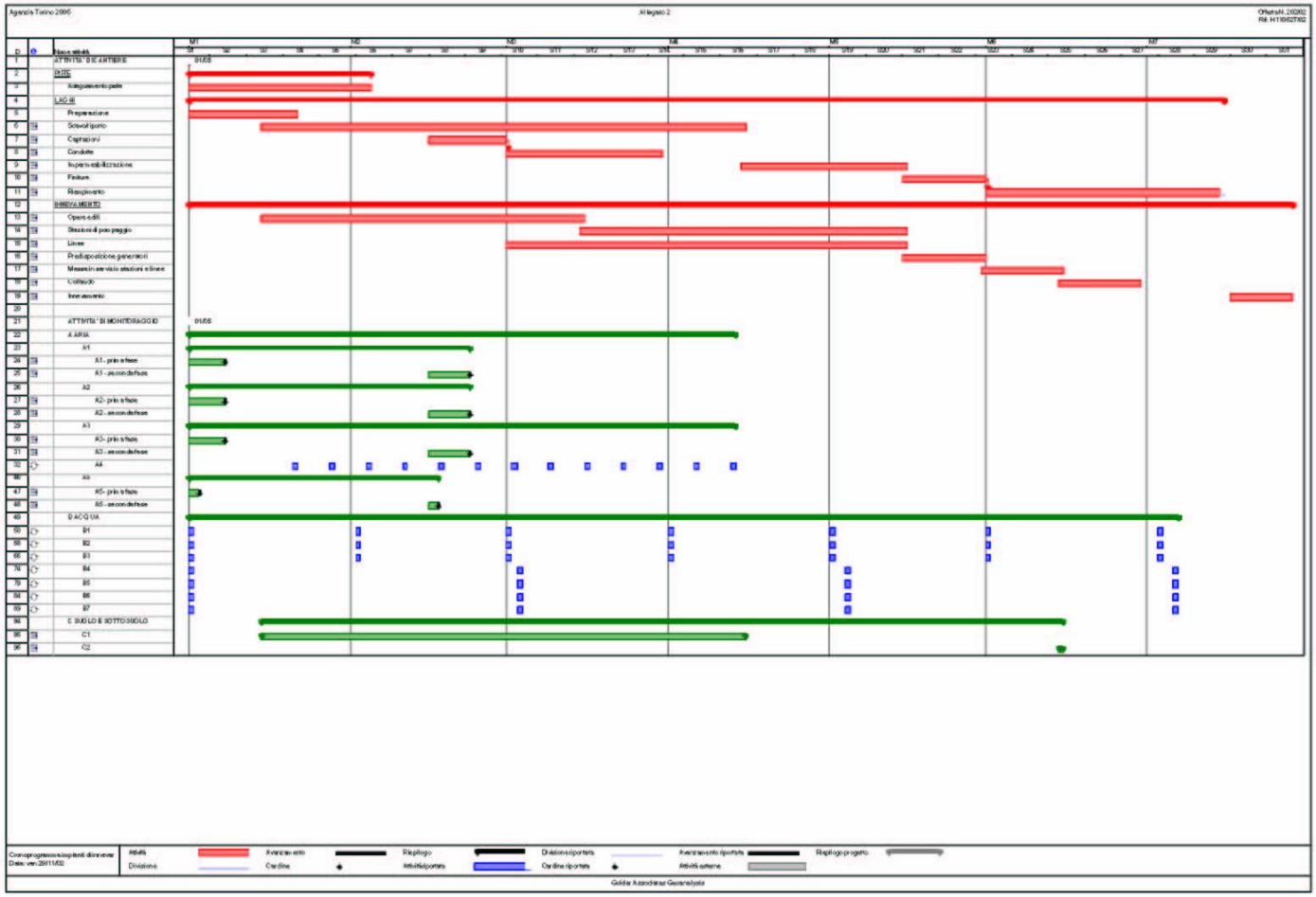
Methodology

Construction activities schedules have been coordinated to identify most critical periods



Methodology

- Potential receptors have been identified in two stages:
  - Aerial maps analysis
  - Field surveys
- Monitoring station representative of receptors have been identified and described in details.
- Monitoring activities for each station have been selected.
- Monitoring documents have been prepared:
  - Aerial photographs
  - Construction activity – monitoring activity matrices

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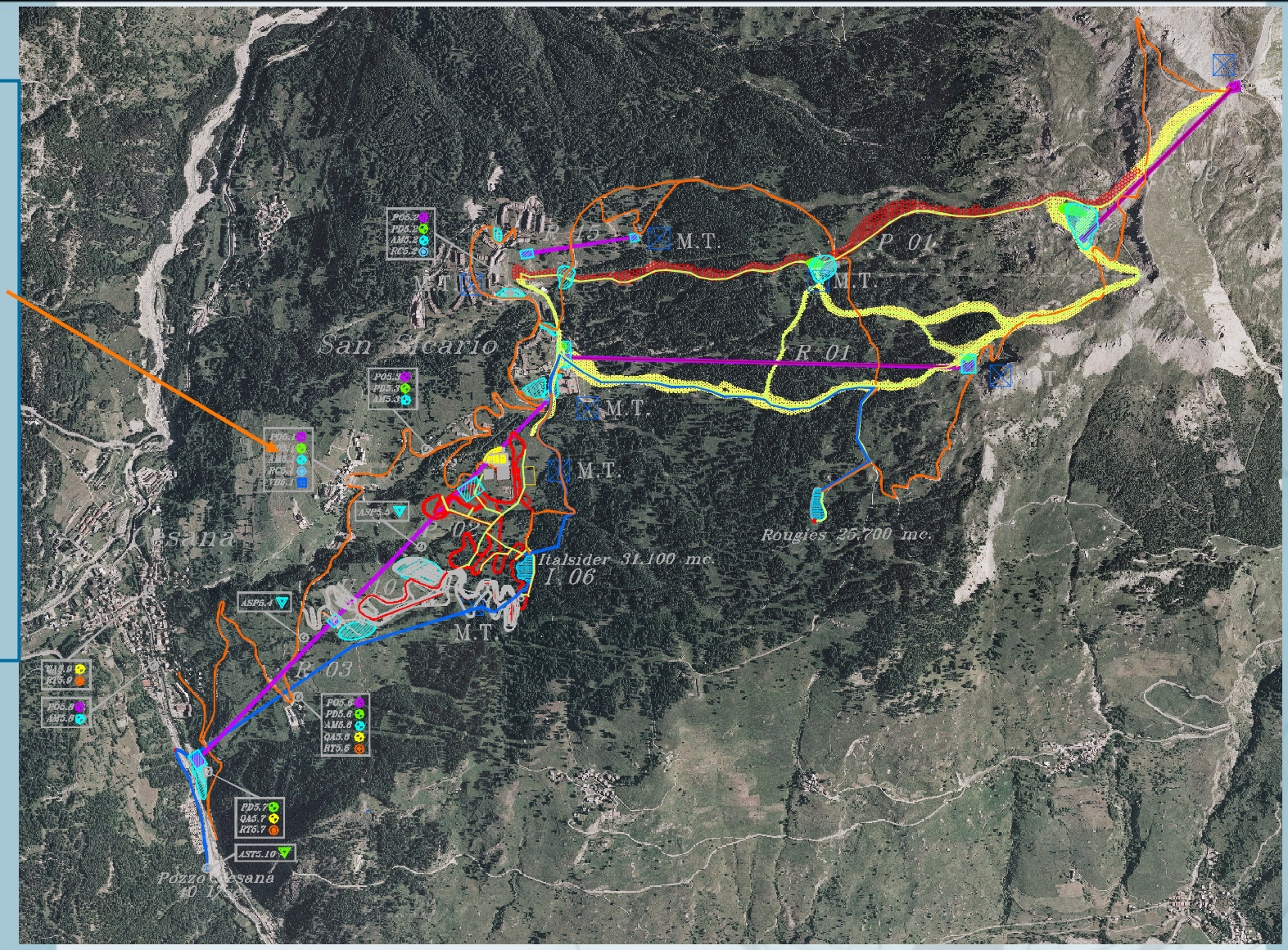
Methodology

Example:

- Suspended particles
- Dust deposition
- Traffic noise
- Vibrations
- Air quality



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Methodology

- Technical specification for each monitoring activity including sampling, handling of samples, analysis and reporting (with reference to Italian legislation and international norms ISO, UNI, ASTM)
- All the above mentioned documents coordinated in 6 “Monitoring plans” and submitted to the Regional Environmental Agency for approval.

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Organisation

- Parties involved:
  - Agenzia Torino 2006
  - Construction supervisors
  - Company executing monitoring
  - Project coordinator (GA)
  - Regional Environmental Agency

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Organization

- Planning of field and lab activities
  - Weekly or bi-weekly planning based on the schedule of the construction works
  - Share of information with the construction supervisors
- Reporting of field and lab activities.
  - Field data forms
  - Lab data forms
  - Preliminary reports (48 hours)
  - Final reports (15 days)

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Organization

- Data management
  - Database
  - Non compliance reports
  - Corrective actions documents
- Reporting of results
  - Before construction “ante operam”
  - During construction (quarterly)
  - After reclamation

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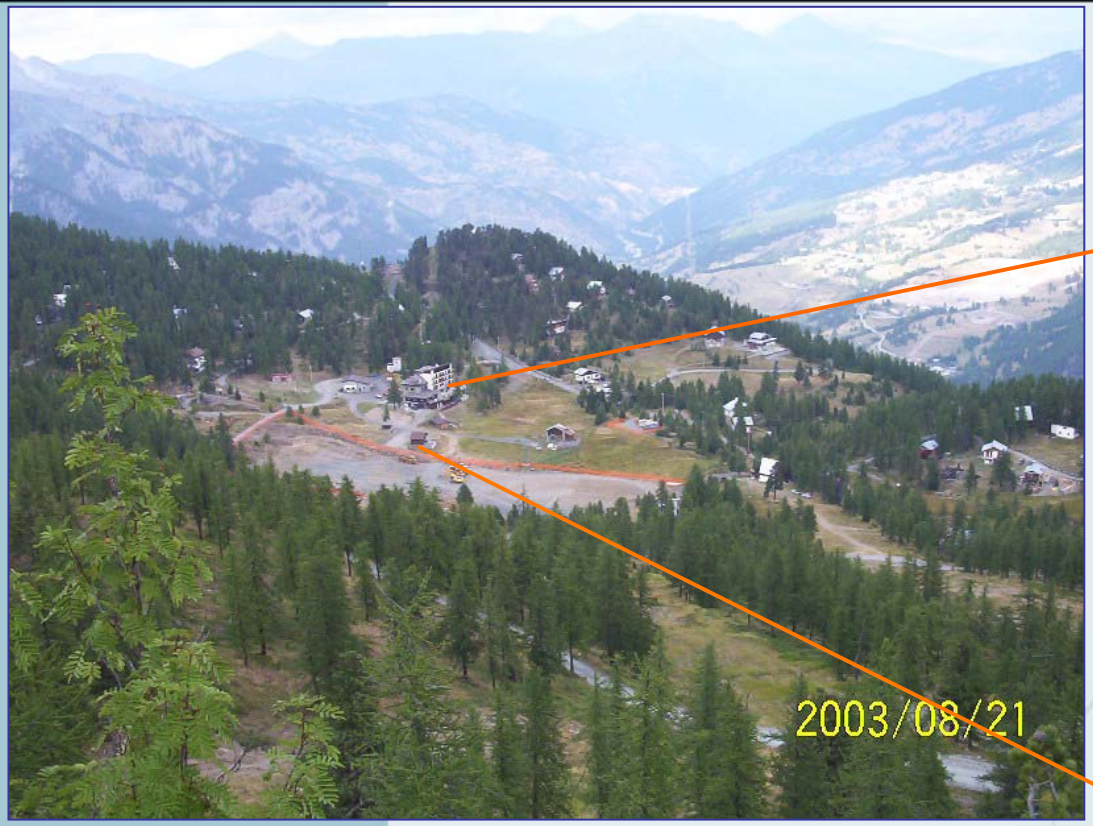
Collecting data



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Collecting data

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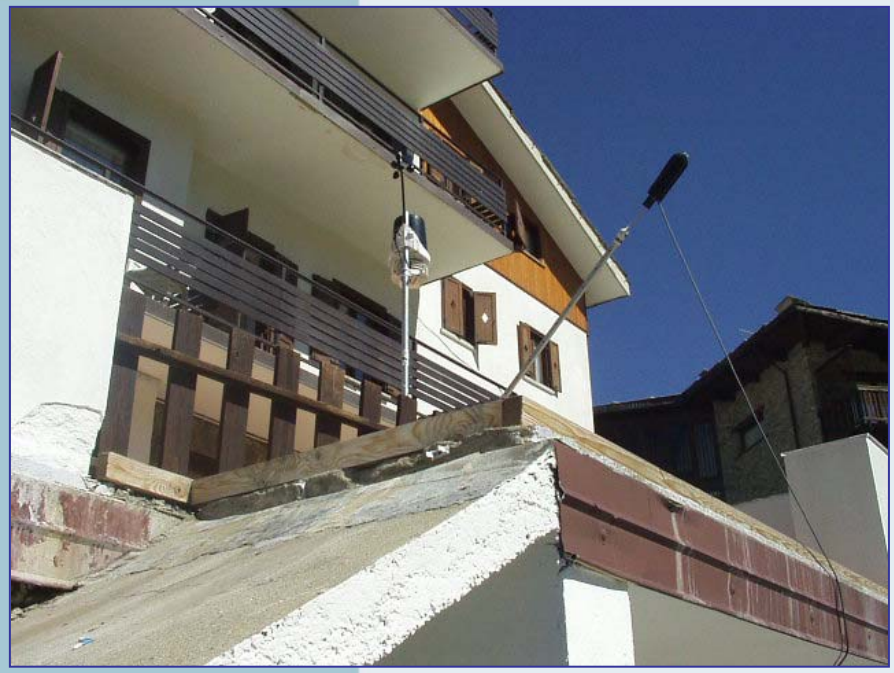
Collecting data



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Collecting data

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Results

DATI GENERALI	RISULTATI
Stazioni di monitoraggio'	Polveri sospese
	Polveri depositabili
Coordinate geografiche	Amianto aerodisperso
	Qualità dell'aria
Unità di misura	Rumore
	Vibrazioni
Limiti di legge	Acque superficiali
	Acque sotterranee

Conclusions

- Organization proved to be able to manage the monitoring system effectively and timely.
- Non-compliance situations managed without significant effects on the construction schedules and costs.
- Costs of monitoring contained within 0.6 % of the overall construction costs.
- Conflicts and complaints sporadic.

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