



Lyon, June 2017

6c.2: Assessment of sustainable use of the subsurface resources

Sustainable Brownfield Restoration in Parc de l'Alba-Barcelona Synchrotron Park



PARCDEL'ALBA **eurecat**
BARCELONA SYNCHROTRON PARK Centre Tecnològic de Catalunya



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH
Escola d'Enginyeria de Barcelona Est



MediTerra
consultors ambientals, s.l.

Sant Maximià, 2 - E-17300 Blanes (GIRONA)

Tel: [+34] 972 35 85 36 Fax: [+34] 972 35 85 37
mediterr@mediterr.es · www.mediterra.es

Contents

- Socio-economic setting of the site and Project organization
- Ecological site settings
- Industrial background characterization
- Sustainability tools used for area development. EU Commission “Business @ Biodiversity” membership accreditation.
- Urban development resources used to define future uses and remediation activities
- Conclusions and weakness

Socio-economic setting of the site



Parc de l'Alba-BSP is an area undergoing urban development located between Cerdanyola del Vallès and Sant Cugat del Vallès, in the centre of the Barcelona Metropolitan Region

Socio-economic setting of the site

PROJECT ORGANIZATION:

- Parc de l'Alba is a partnership between:
 - Cerdanyola city council
 - Catalan Government (INCASOL)
 - Private investors, are not part of the Consortia



Ajuntament de
Cerdanyola del Vallès



Generalitat de Catalunya



Socio-economic setting of the site

A 400 hectare public park with 56% of green areas



GREEN SPACES: 180ha

Green corridor 140ha
Urban parks 40ha

BUSINESS AREA:

100 plots — 640.000m²

Companies established: IBM, SENER, Natura Bissé, Sic Immoles, Synchrotron Alba, Stradivarius, T-Systems.

Some 4.000 housing units

Ecological settings

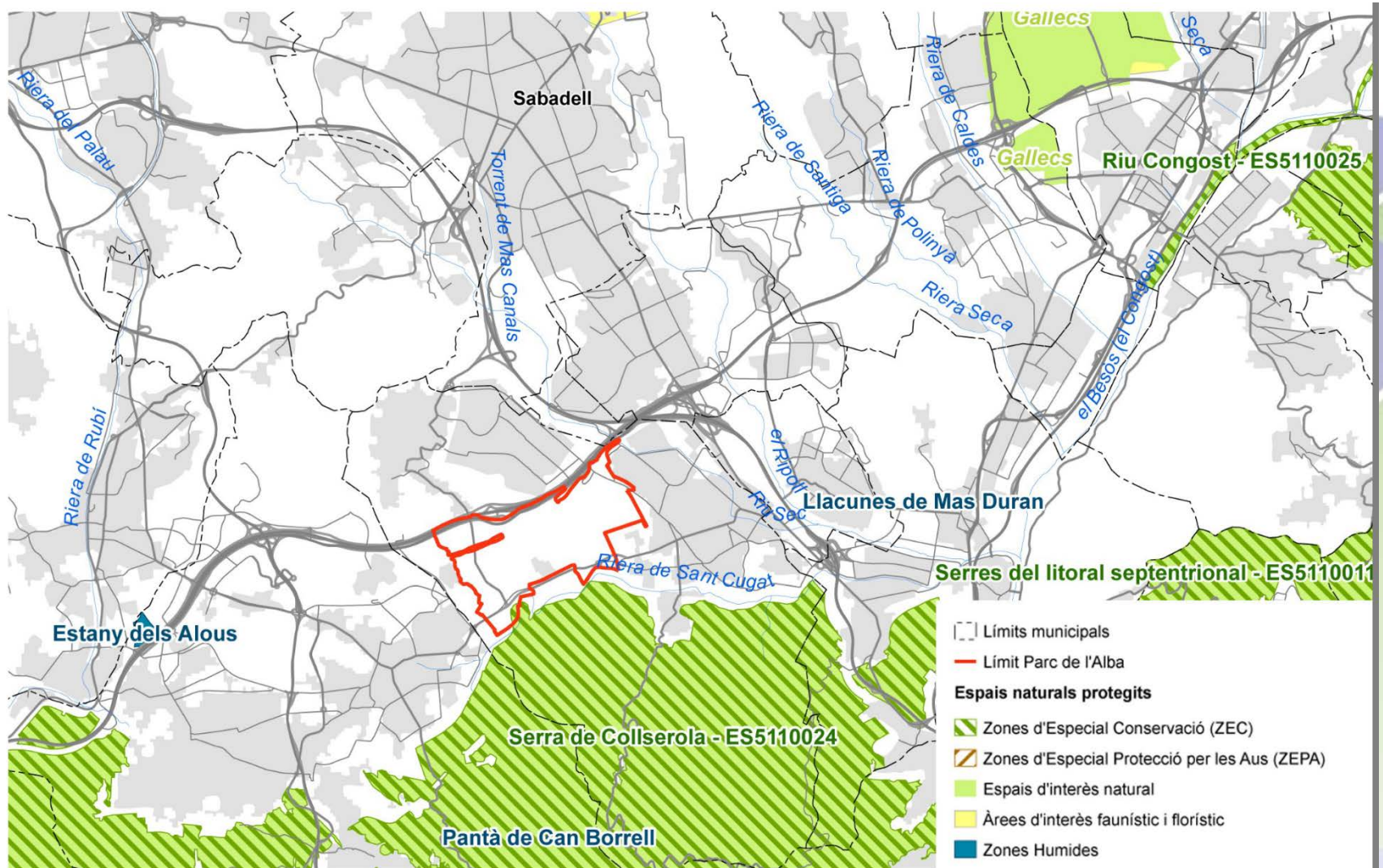


Figura 4. Situació del BSP-Parc de l'Alba (de color vermell) en relació als espais naturals integrats a la xarxa Natura 2000.

Ecological settings

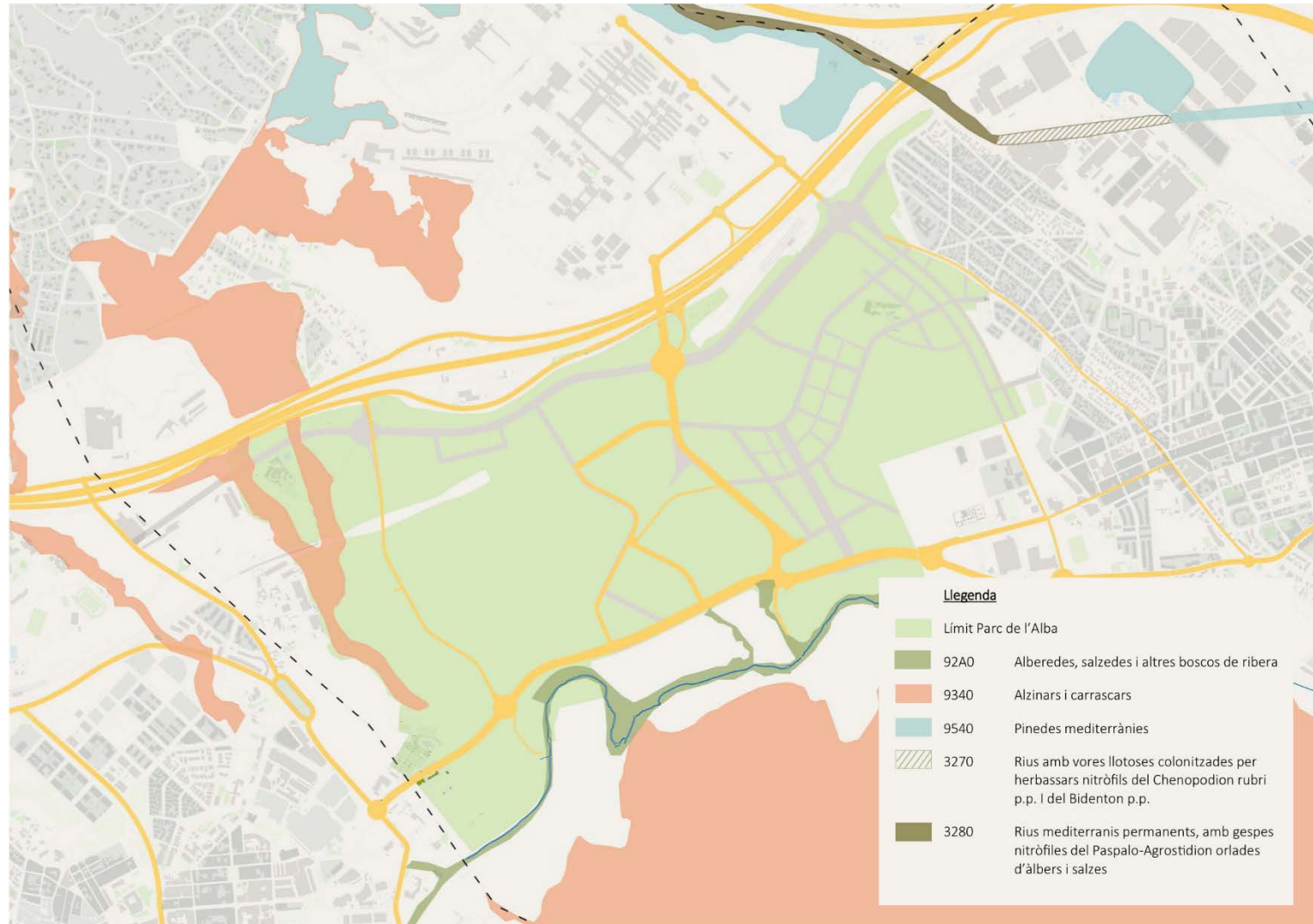


Figura 5 . Localització dels Hàbitats d'Interès Comunitari que es troben al Parc de l'Alba i la seva perifèria .

Ecological settings

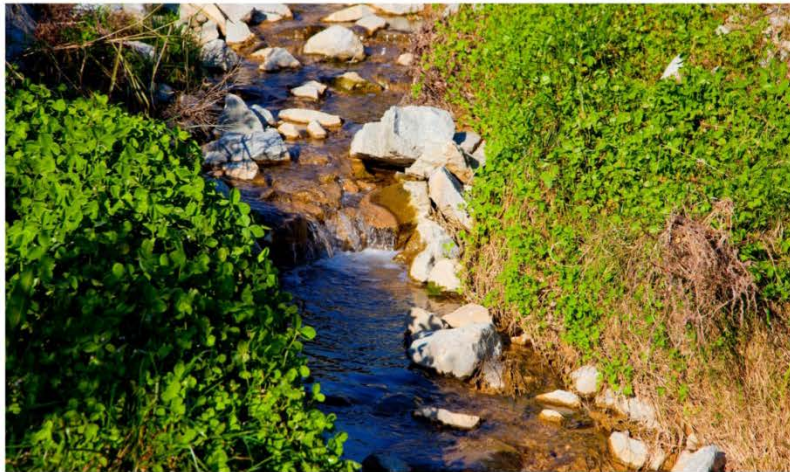


Figura 6. Els conreus de secà, i la rica diversitat biològica que s'hi associa, es conserven en extensos sectors del Parc de l'Alba gràcies a acords amb pagesos. També s'hi troben rodals d'alzinars qualificats com a Hàbitat d'Interès Comunitari. Fotos: Minuartia i Parc de l'Alba

Ecological settings



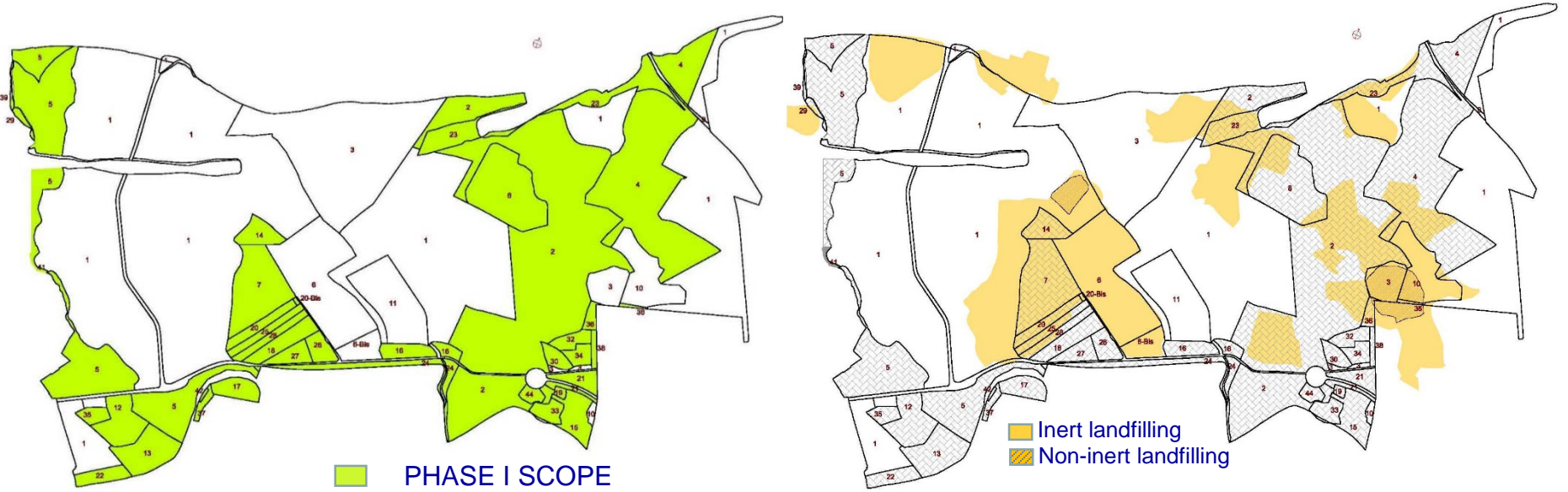
Figura 7. Teixó, guineu i geneta, carnívors que es troben als boscos i altres ambients del Parc Natural de Collserola i que també trobem associats a diversos hàbitats del Parc de l'Alba. Fotos: Pepo Navarro i Minuartia.



Industrial background characterization

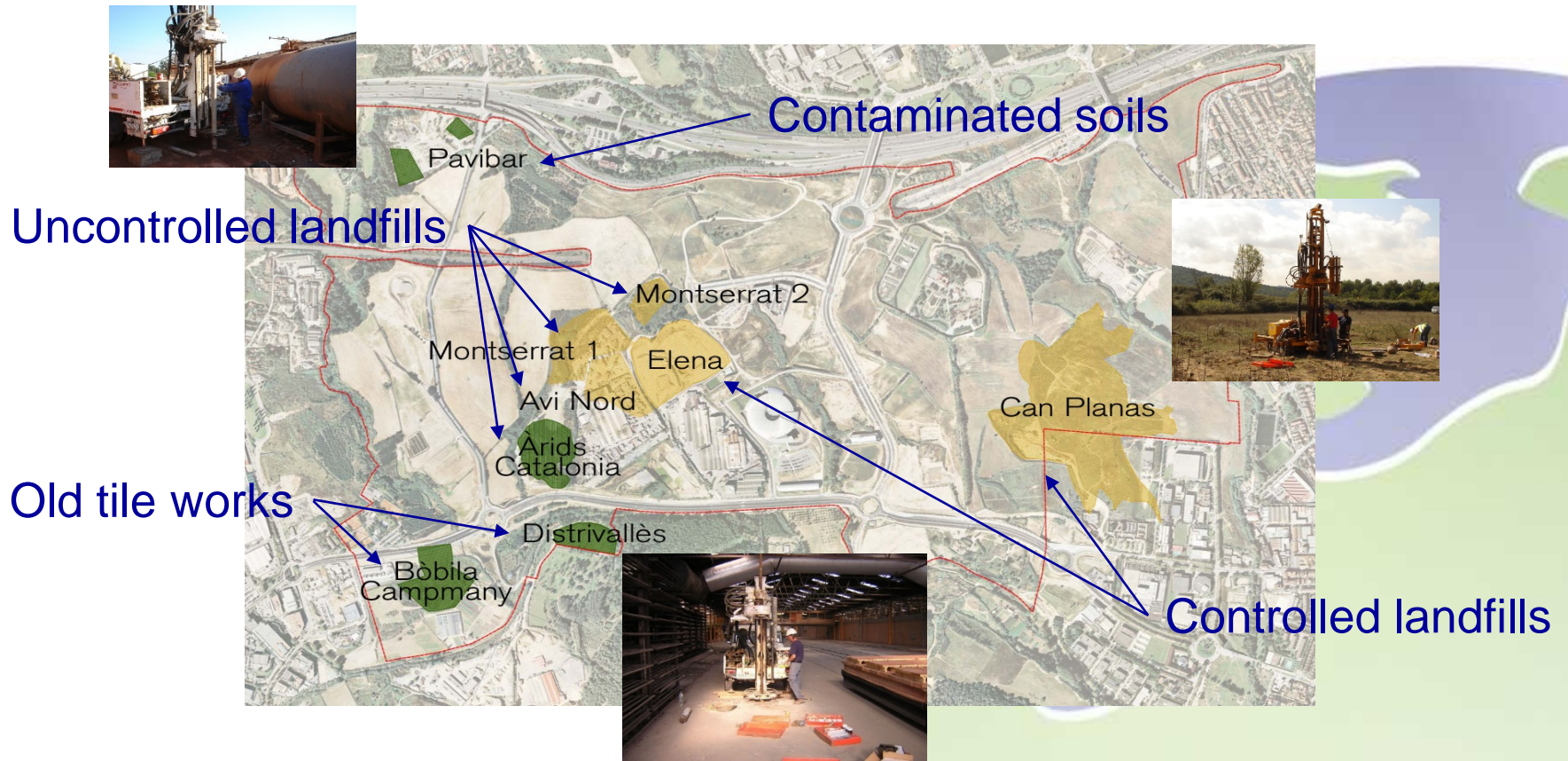
- 39 hectares of the total surface occupied by brownfields, all those industrial activities with potential affection to soils and groundwater
- Ceramic industries, mining activities (clay pit extractions), landfills, asphalt factory and small workshops.

Industrial background characterization



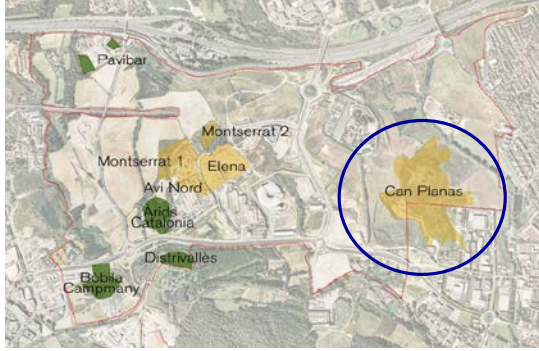
- Definition of potentially contaminated land for the taxation of the goods and properties to be **expropriated** by the public administration.

Industrial background characterization



- 18% of the area has already been restored
- All actions carried out to date costed €3.3 M and created approximately 15 direct temporary jobs and 80 indirect jobs.

Can Planas: a former landfill

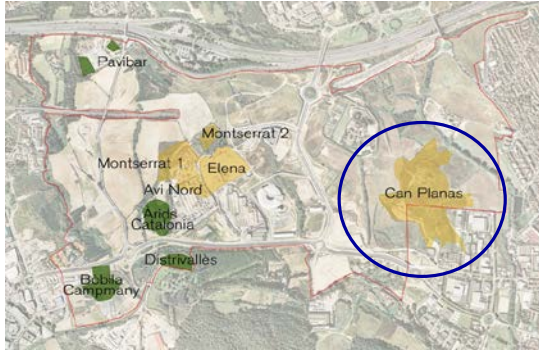


- Old clay quarry later filled with different materials (soil, construction debris and hazardous waste)
- 18 Ha, 2.5 millions m³
- A part of the landfill was legally authorized during the 80's and it was finally closed down in 1995.

- In a preliminary urban plan development (before site investigations) a residential area was planned on top of the landfill.
- After several site investigations, the urban plan was changed avoiding buildings on the landfill location.

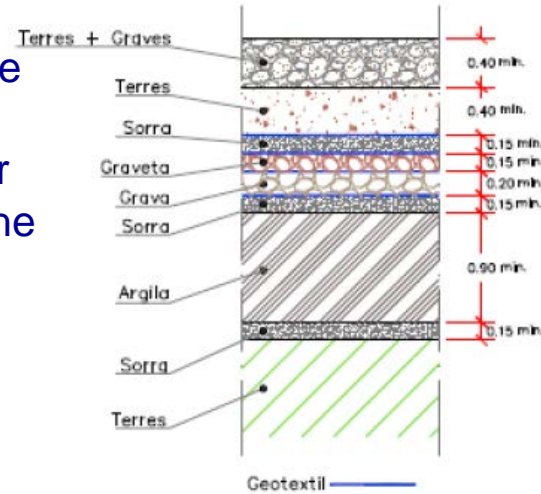


Can Planas: remediation approach



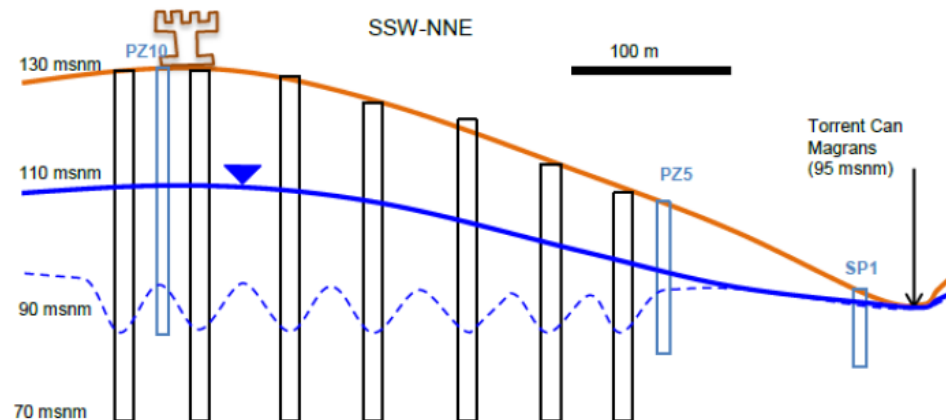
Installation of a Biocover layer to avoid roots and animals, and maintain the humidity in the soil

Minimizing the intake of rain water in order to minimize the discharge of leachate.

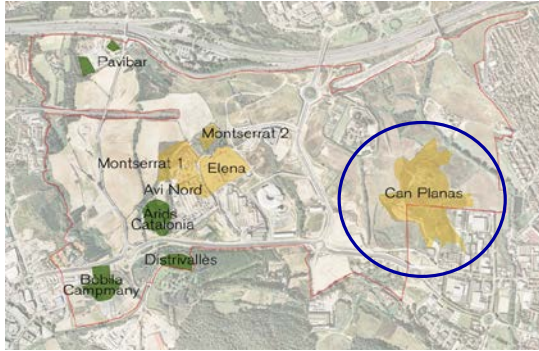


Installation of an upstream hydraulic barrier (from the subsoil)

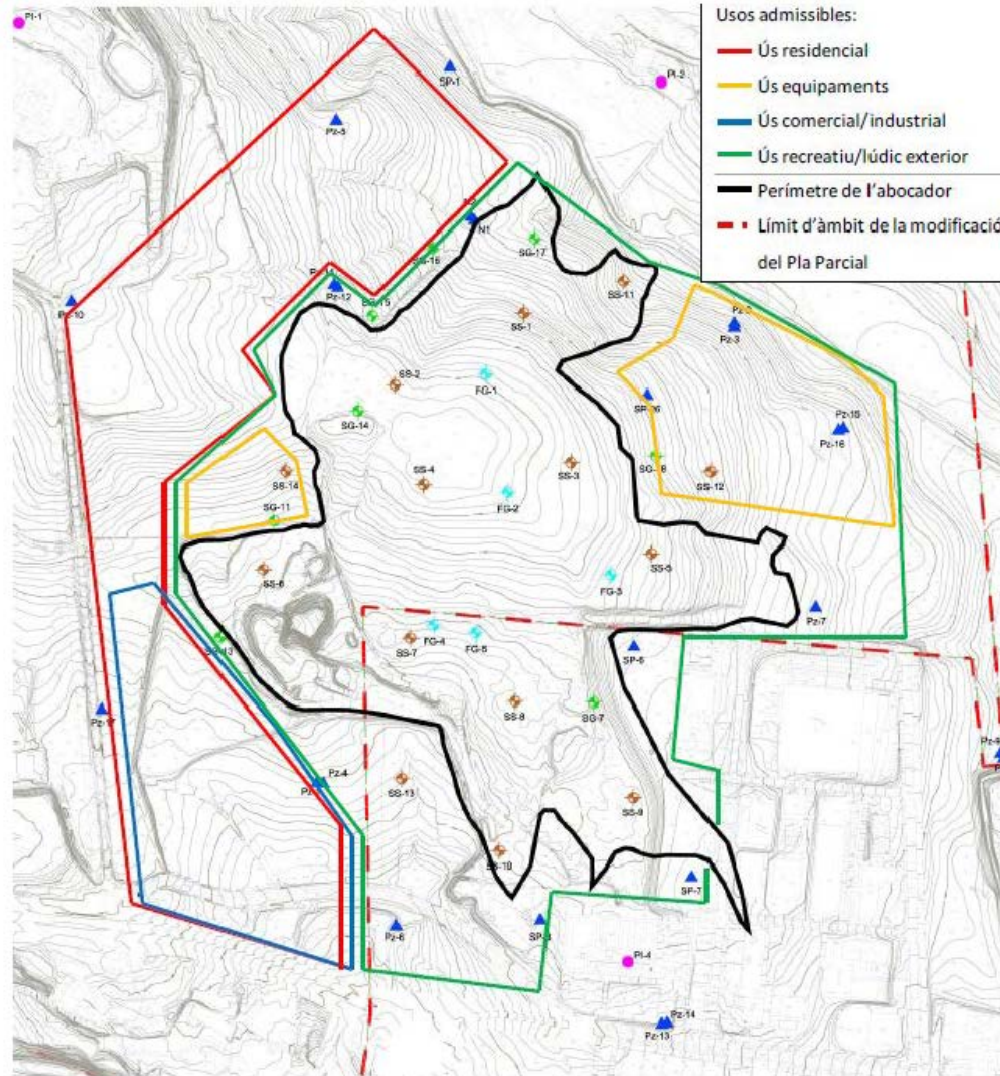
Reducing gas emissions by passive gas extraction.



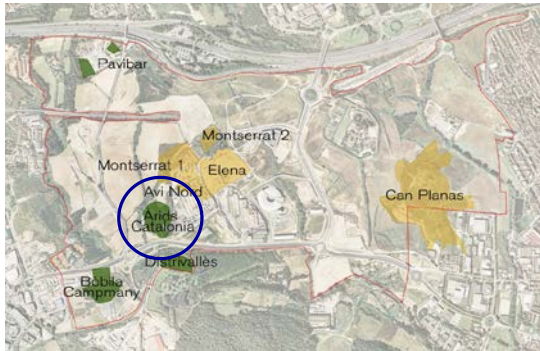
Can Planas: future land uses



Approach based on HHRA:



Arids Catalonia: a site with asbestos



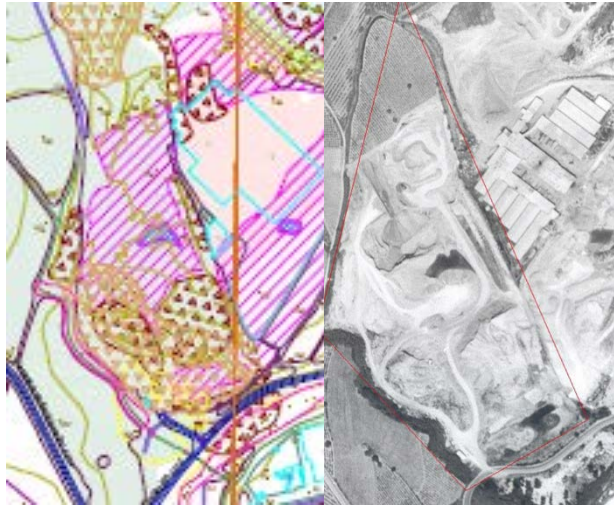
Former uncontrolled landfill of demolition materials including asbestos exploited in the 70's.

Corrugated asbestos industry in the area

Approved remediation project by authorities

- Solutions based on the HHRA:
 - Confine asbestos in situ by means of a clay and soil cover to prevent the inhalation pathway
 - Define restrictions in the Urban Plan for the allowed uses and management conditions of this plot.
- The site has already been restored and reforested

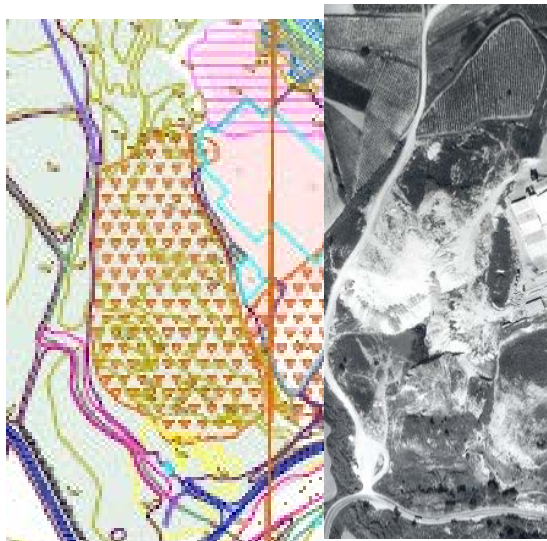
Arids Catalonia: historical photos



1967



1970






1975

Until 1964 Undeveloped land

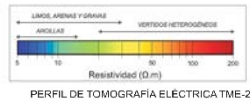
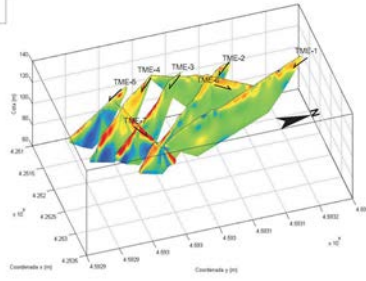
1964-1970 Clay extraction

1970-1982 Waste dumping
(including asbestos sludge)

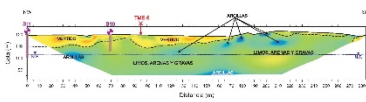
-  Actividad extractiva
-  Actividad de relleno y/o vertido
-  Balsas y zonas con agua

Arids Catalonia: geophysical studies

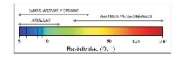
MODELO 3D



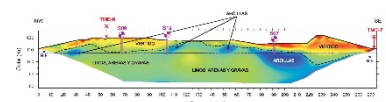
PERFIL DE TOMOGRAFÍA ELÉCTRICA TME-1



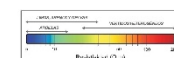
TME-1
 1. LÍNEA ARENOSA Y GRAVA
 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS



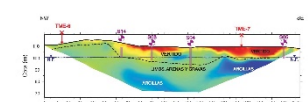
PERFIL DE TOMOGRAFÍA ELÉCTRICA TME-2



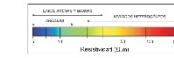
TME-2
 1. LÍNEA ARENOSA Y GRAVA
 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS



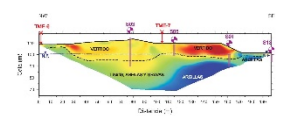
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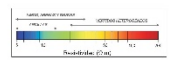
TME-3
 1. LÍNEA ARENOSA Y GRAVA
 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS



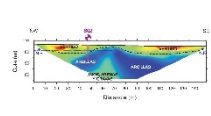
PERFIL DE TOMOGRAFÍA ELÉCTRICA TME-4



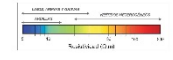
TME-4
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 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS



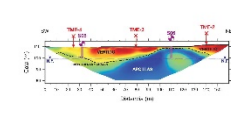
PERFIL DE TOMOGRAFÍA ELÉCTRICA TME-5



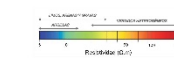
TME-5
 1. LÍNEA ARENOSA Y GRAVA
 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS



PERFIL DE TOMOGRAFÍA ELÉCTRICA TME-7



TME-7
 1. LÍNEA ARENOSA Y GRAVA
 2. VEREDOS HETEROGÉNEOS
 3. ARENILLAS
 4. LÍNEA ARENOSA Y GRAVA
 5. VEREDOS HETEROGÉNEOS
 6. ARENILLAS

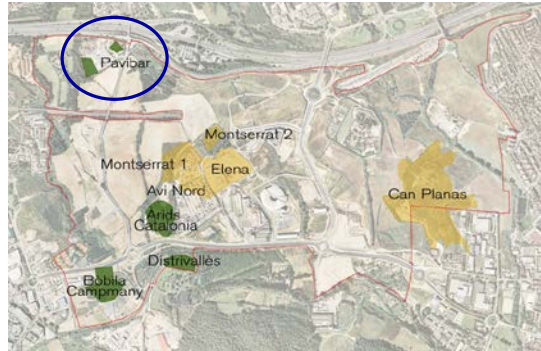


Arids Catalonia: new recreational uses



- New paths have been equipped with signposting for its public use
- The area was incorporated to the Parc de l'Alba green corridor in 2012

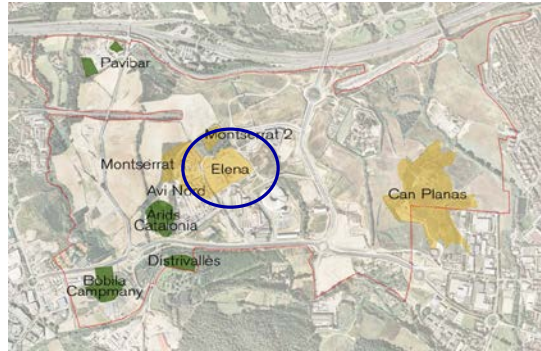
Pavibar: a former asphalt factory



- Former asphalt factory used for the AP7 motorway that caused soil contamination by fuel and metals.
- Site abandoned in the early 2000s leaving the factory without dismantling.
- Solution based on the HHRA:
 - Excavation and subsequent management of the contaminated soil
 - Most of the soil was sent to a cement factory (valorization)
 - Small fraction was rejected and therefore sent to a landfill
 - Inert materials and soils stored in the abandoned plot are being reused in the restoration of this and other degraded areas.



Elena: a new landfill development



Controlled landfill since 2007 for municipal waste.

Methane gas has been detected (6,000 m³/hour), which now is injected into the natural gas network

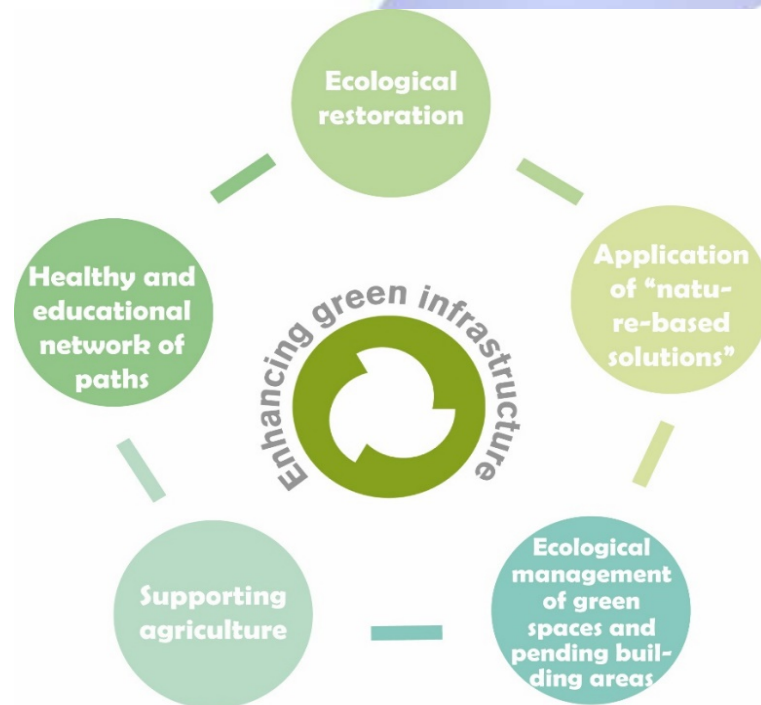


Verification of its compatibility for future uses as a recreational area will still need to be done

Sustainable tools

The Parc de l'Alba-BSP action program, designed to support its Green Infrastructure and integrated Brownfield restoration, is structured in 5 strategic axes including:

- Ecological and Brownfield restoration
- Application of “nature based solutions”
- Ecological management of green spaces and building areas
- Supporting agriculture
- Healthy and educational network paths



Sustainable tools

This commitment was awarded in 2016 with the European Commission “Business @ Biodiversity” label.



**Business @
Biodiversity**

Sustainable tools

CORE AREA 1 : Ecological restoration

Action 1. Conservation of the green corridor



Sustainable tools

CORE AREA 1 : Ecological restoration

Action 2. Restoration of watercourses





Sustainable tools

CORE AREA 1 : Ecological restoration

Action 3. Restoration of forests



Sustainable tools

Infraestructure permeability



Detalls de les adaptacions realitzades a l'estructura mixta construïda a la carretera BP1413 al seu pas pel torrent del Bosc



de Can Fatjó per afavorir el pas de la fauna i que integren refugis per a petita fauna com ara els micromamífers.

Foto aèria realitzada a l'any 2008 durant la construcció de la carretera BP1413. S'observa en primer pla, la desfragmentació aconseguida amb les dues estructures transversals construïdes al corredor verd. A l'esquerra el viaducte de Can Fatjó de 120 m d'amplada, i a la dreta el viaducte del Torrent del Bosc de 30m d'amplada.



de 61



Detall de les adaptacions realitzades a l'estructura mixta construïda a la carretera BP1413 al seu pas pel torrent del Bosc

Sustainable tools

CORE AREA 1 : Ecological restoration

Action 5. Restoration of soils degraded by former activities



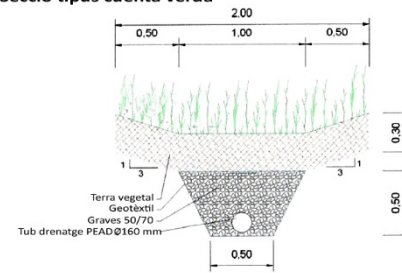
Sustainable tools

CORE AREA 2 : Application of “nature-based solutions”

Action 6. Naturalised drainage systems



Secció tipus cuenta verda



Sustainable tools

CORE AREA 2 : Application of “nature-based solutions”

Action 8. Promote green



Sustainable tools

CORE AREA 3 : Ecological management of green spaces and pending building areas

Action 9. Natural communities and dryland croplands conservation on currently unbuilt plots



Sustainable tools

CORE AREA 3 : Ecological management of green spaces and pending building areas

Action 10. Ecological gardening practices and foresting of associated fauna



Sustainable tools

CORE AREA 3 : Ecological management of green spaces and pending building areas

Action 11. Recovery of unique trees



Sustainable tools

CORE AREA 4 : Supporting agriculture

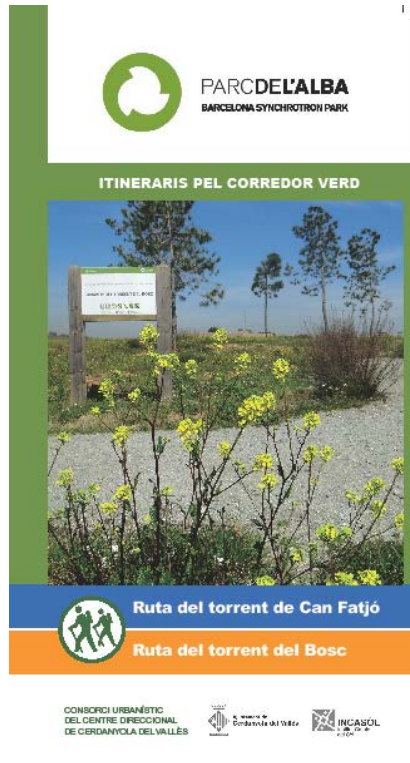
Action 12. Agreements with farmers to promote biodiversity-suited croplands in the green corridor and undeveloped plots



Sustainable tools

CORE AREA 5 : Healthy and educational network of paths

Action 13. Setting up of a network of paths to impart knowledge on the Parc de l' Alba's green infrastructure



Concluding thoughts

The Urban Development Plan for this area has been changing from:

- a initial approach where the urban plan was developed in parallel to site investigations and nature restoration projects, without much integration
- to a new approach where the **redevelopment of degraded areas** and **nature protection tools** have been integrated into a **new urban planning** where restoration activities and potential uses have been developed in a **legislative tool**.
- The overall project management was changed **to take into account HHRA** results in the remediation plans of the contaminated areas, for urban, business and ecological development.

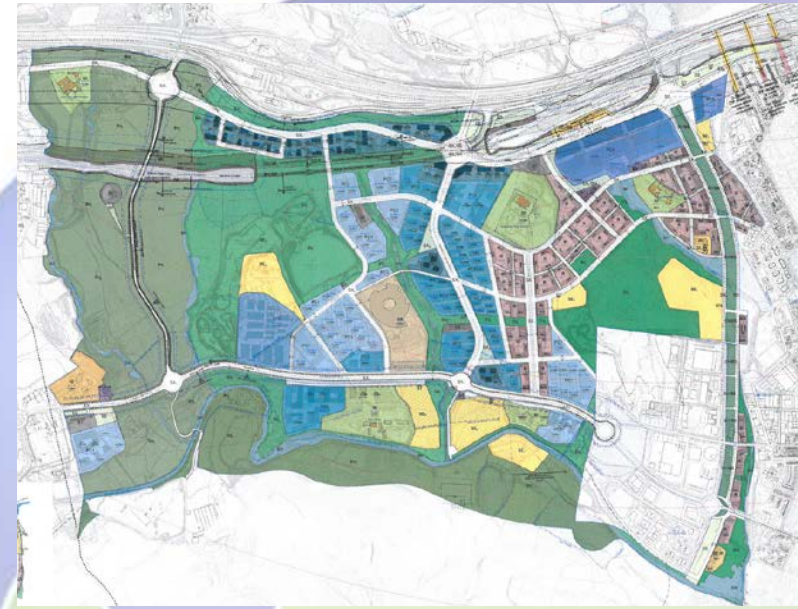
New Urban Plan Tools: cost reduction

Can Planas remediation costs

Urban planning 2008
From €30 M



Urban planning 2017
To €10 M



FINANCING

- 40% Barcelona metropolitan area
- 40% Waste Agency of Catalonia
 - 20% Local authorities
- Investors wants to contribute

New Urban Plan Tools

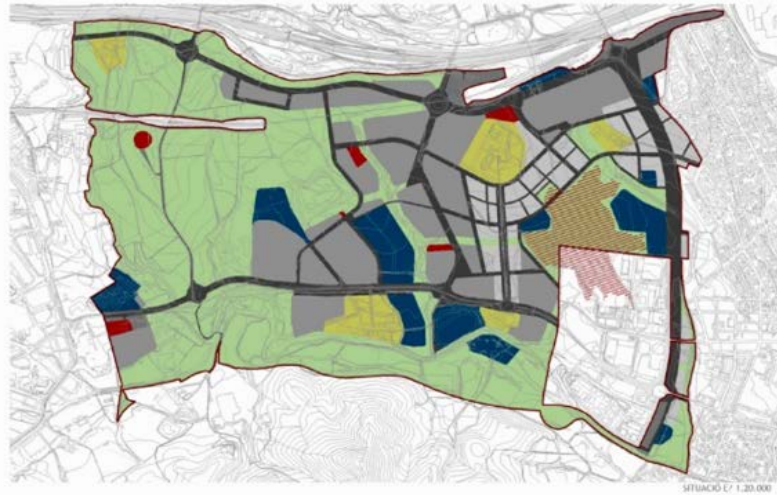
QUALIFICACIÓ URBANÍSTICA

SV. ESPAIS LLIURES

S1. EQUIPAMENTS DELIMITATS

ÀMBITS D'ESTUDI DEL SUBSÒL DEL CENTRE DIRECCIONAL DE CERDANYOLA DEL VALLÈS

01. CAN PLANAS. 1a ANTIC DIPÒSIT



CONDICIONS DE L'ACTUACIÓ

Aquesta sol·licitud ha de ser objecte de Restauració Ambiental, per poder adquirir les condicions d'ús a què estan destinats. Malgrat el risc calculat dona admissible, es recomanen les següents actuacions de millora:

- 1) Millorar el confinament per a minimitzar l'entrada d'aigua de pluja i sortida de gasos, consistent en un segellat superficial de triple capa a sobre de l'abocador.
- 2) Un bombeig algües amunt de l'abocador per minimitzar l'entrada d'aigua subterrània (Veure esquema barrera hidràulica i ubicació de pous d'aquesta fixa)
- 3) Sota el sistema d'impermeabilització s'hauria de posar un sistema d'extracció de gasos que garanteixi que el dipòsit es trobi permanentment a una pressió lleugerament per sota de l'atmosfèrica
- 4) Establir un monitoratge de l'abocador en els vectors algües subterrànies i altre.

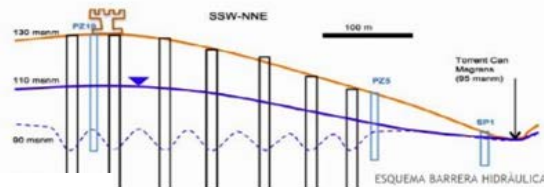
(*) L'ESTUDI D'OBRES BÀSIQUES INCORPORA AQUESTES DETERMINACIONS

IMPLICACIONS AL PLANEJAMENT URBANÍSTIC

Usos admissibles:

- 1) A l'àrea de l'abocador, només estan permesos els usos recreatius a l'exterior i sense cap tipus d'edificació per tal d'evitar espais poc aïrejats on es puguin acumular gasos, i per tal de protegir la integritat del nou segellat.
 - 2) Evitar la construcció de soterranis a les zones on el nivell freàtic es troba molt proper (-5 m) a la superfície del terreny (zona est, sud est i sud) per tal d'evitar l'afectació a les algües subterrànies (Veure figura de piezometria)
 - 3) Els usos estan definits seguint les directrius dels usos admissibles a sobre i al voltant de l'abocador. (Veure figura dels usos admissibles)
- Altres consideracions:
- 4) Garantir l'estanqueïtat de les xarxes soterrades (abastament, clavegueram, plufals, ...) tant a sobre l'abocador com al voltant.

RESTAURACIÓ: A càrrec i mitjançant conveni Interadministratiu de ARC, AMB i Ajuntament de Cerdanyola del Vallès, condicionada al sector del parc Tecnològic.



ÀMBITS D'ESTUDI DEL SUBSÒL DEL CENTRE DIRECCIONAL DE CERDANYOLA DEL VALLÈS

01. CAN PLANAS. 1b ANTIC DIPÒSIT

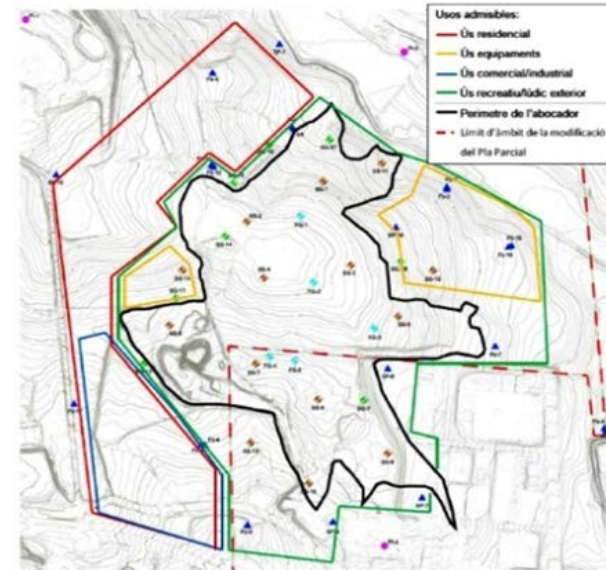
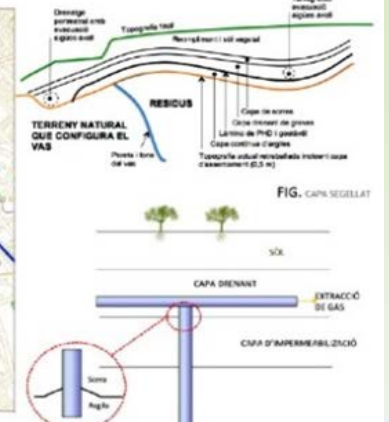
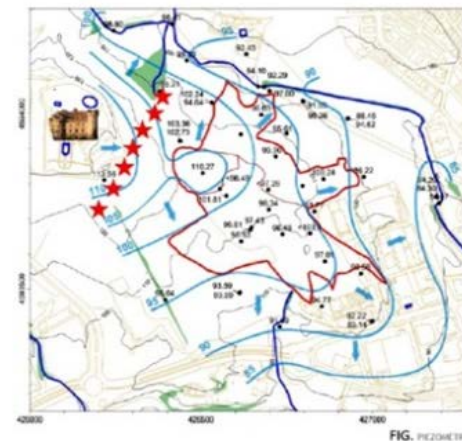


FIG.
LA PROPOSTA DE PLANEJAMENT S'HA PORTAT A TERRE AMB LES DIRECTRIUS I ZONIFICACIÓ DEFINIDA, INCORPORANT USOS ADMISSIBLES EN L'ÀMBIT DE L'ABOCADOR (ESPAIS LLIURES I EQUIPAMENTS A L'ÀMBIT 11.1.B.10)



Weakness of the overall process

- The organization of the different authority bodies with shared competences (groundwater, contaminated soils, landfills, urban planning) makes the technical validation of the action plans complicated to achieve. Uncertainties for potential investors.
- Even though it is known that the involvement of stakeholders is necessary in the decision-making process, the collaboration is still an unresolved issue.
- The economical burden of the remediation cost and associated liabilities falls mainly on the public administration.
- Maintenance of remediation/containment measures, falls in the public administration but developers will need to support it

MERCI

boronat@mediterranea.es



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