ALCUNI CASE HISTORY

<table>
<tr><th colspan="2">1) PRETRATTAMENTO DEI REFLUI CIVILI E
TRATTAMENTO DELLE RETI FOGNARIE</th></tr>
<tr><td>Sito</td><td>Centro abitato in comune costiero, per un totale di 20.000÷30.000 abitanti equivalenti, presente prevalentemente nei mesi di luglio e agosto.</td></tr>
<tr><td>Tipologia del refluo</td><td>Reflui Civili</td></tr>
<tr><td>Tipo di trattamento</td><td>Pre Trattamento delle acque reflue e Trattamento delle reti fognarie</td></tr>
<tr><td>Problemi riscontrati</td><td>Il Comune non è dotato di un impianto completo di trattamento delle acque reflue ma solo della sezione filtrazione e di una Condotta a mare con diffusore.
Produzione di odori sgradevoli, in condizioni anaerobiche, dei fenomeni di putrefazione e riduzione dei fanghi.
Incrostazioni dovute ad agglomerati di grasso e detergenti con conseguente riduzione della sezione libera.
Deposito di fanghi organici con possibile intasamento e riflusso dei liquami.
Elevato carico organico</td></tr>
<tr><td>Applicazione</td><td>Applicazioni settimanali di prodotti biotecnologici all’inizio di ogni sezione delle tratte fognarie interessate, in relazione agli abitanti equivalenti di ciascuna. Le applicazioni vengono eseguite manualmente nei pozzetti di ispezione.</td></tr>
<tr><td>Risultati ottenuti</td><td>Odori – Rimozione totale degli odori su tutta larete fognaria dopo 15 giorni.
Collettori – Normalizzazione della tratta fognaria, riduzione dei fanghi organici e disincrostazione delle amalgame (grassi-detergenti) dopo 20 giorni, con miglioramento della portata e drastica riduzione degli interventi di svuotamento.
Acque reflue – normalizzazione della qualità delle acque reflue in ingresso all'impianto con eliminazione dei sovraccarichi e significativa riduzione della sostanza organica, come evidenziato dai principali parametri monitorati, di seguito riportati:
<table>
<tr><th>Parametri</th><th>Riduzioni</th></tr>
<tr><td>COD</td><td>- 36 %</td></tr>
<tr><td>COD Filtrato</td><td>- 22 %</td></tr>
<tr><td>Ammoniaca</td><td>- 32 %</td></tr>
<tr><td>Materiali sedimentabili</td><td>- 12 %</td></tr>
<tr><td>Tensioattivi</td><td>- 77 %</td></tr>
</table></td></tr>
</table>

2) PRETRATTAMENTO DEI REFLUI CIVILI E TRATTAMENTO DELLE RETI FOGNARIE

Sito	Centro abitato in comune costiero, per un totale di 13.000 abitanti equivalenti, presente prevalentemente nei mesi di luglio e agosto.
Tipologia del refluo	Reflui Civili
Tipo di trattamento	Pre Trattamento delle acque reflue e Trattamento delle reti fognarie
Problemi riscontrati	● Produzione di odori sgradevoli, in condizioni anaerobiche, dei fenomeni di putrefazione e riduzione dei fanghi. ● Incrostazioni dovute ad agglomerati di grasso e detergenti con conseguente riduzione della sezione libera. ● Deposito di fanghi organici con possibile intasamento e riflusso dei liquami. ● Elevato carico organico
Applicazione	Applicazioni settimanali di prodotti biotecnologici all'inizio di ogni sezione delle tratte fognarie interessate, in relazione agli abitanti equivalenti di ciascuna. Le applicazioni vengono eseguite manualmente nei pozzetti di ispezione.
Obtained results	● **Odori** – Rimozione totale degli odori su tutta larete fognaria dopo 7 giorni. ● **Collettori** – Normalizzazione della tratta fognaria, riduzione dei fanghi organici e disincrostazione delle amalgame (grassi-detergenti) dopo 15 giorni, con miglioramento della portata e drastica riduzione degli interventi di svuotamento. ● **Acque reflue** – normalizzazione della qualità delle acque reflue in ingresso all'impianto con eliminazione dei sovraccarichi e significativa riduzione della sostanza organica, come evidenziato dai principali parametri monitorati, di seguito riportati: **Parametri** — **Riduzioni** COD — - 38 % COD Filtrato — - 52 % Ammoniaca — - 37 % Materiali sedimentabili — - 58 %

3) PRETRATTAMENTO DEI REFLUI CIVILI E TRATTAMENTO DELLE RETI FOGNARIE

Site	Centro abitato in comune costiero, per un totale di 20.000÷30.000 abitanti equivalenti, presente prevalentemente nei mesi di luglio e agosto.
Tipologia del refluo	Reflui Civili
Tipo di trattamento	Pre Trattamento delle acque reflue e Trattamento delle reti fognarie
Problemi riscontrati	● Produzione di odori sgradevoli, in condizioni anaerobiche, dei fenomeni di putrefazione e riduzione dei fanghi. ● Incrostazioni dovute ad agglomerati di grasso e detergenti con conseguente riduzione della sezione libera. ● Deposito di fanghi organici con possibile intasamento e riflusso dei liquami. ● Elevato carico organico
Applicazioni	Applicazioni settimanali di prodotti biotecnologici all'inizio di ogni sezione delle tratte fognarie interessate, in relazione agli abitanti equivalenti di ciascuna. Le applicazioni vengono eseguite manualmente nei pozzetti di ispezione.
Risultati ottenuti	● **Odori** – Rimozione totale degli odori su tutta larete fognaria e nell'impianto di depurazione dopo 10 giorni. ● **Collettori** – Normalizzazione della tratta fognaria, riduzione dei fanghi organici e disincrostazione delle amalgame (grassi-detergenti) dopo 30 giorni, con miglioramento della portata e drastica riduzione degli interventi di svuotamento. ● **Acque reflue** – normalizzazione della qualità delle acque reflue in ingresso all'impianto con eliminazione dei sovraccarichi e significativa riduzione della sostanza organica, come evidenziato dai principali parametri monitorati, di seguito riportati: **Parametri** — **Riduzioni** ● COD — - 45 % ● Ammoniaca — - 55 % ● Materiali sedimentabili — - 70 % ● Residuo a 105° — - 80 %

<table>
<tr><th colspan="2">4) PRETRATTAMENTO DEI REFLUI CIVILI E TRATTAMENTO DELLE RETI FOGNARIE</th></tr>
<tr><td>Site</td><td>Parte di un centro abitato di un comune turistico posto nell'entroterra e alcune piccole frazioni, per un totale di 2.000 abitanti equivalenti</td></tr>
<tr><td>Tipologia del refluo</td><td>Reflui Civili</td></tr>
<tr><td>Tipo di trattamento</td><td>Pre Trattamento delle acque reflue e Trattamento delle reti fognarie. Inoltre in alcuni canali sono stati effettuati alcuni trattamenti per la regressione biologica dei sedimenti organici.</td></tr>
<tr><td>Problemi riscontrati</td><td>Il comune non è dotato di un impianto di trattamento e le acque reflue vengono inviate in canali e fossi a cielo aperto.
Produzione di odori sgradevoli in condizioni anaerobiche, e presenza di fenomeni di putrefazione e riduzione dei fanghi. Gli odori erano persistenti nel centro abitato nei tratti aperti finali e in relazione alle variazioni della pressione atmosferica.
Incrostazioni dovute ad agglomerati di grasso e detergenti con conseguente riduzione della sezione libera.
Deposizione di fanghi organici sul letto dei fossi.
Elevato carico organico con conseguenze negative sull'ecosistema dei corsi d'acqua, trasformati in fognature a cielo aperto e produzione di cattivi odori.</td></tr>
<tr><td>Applicazioni</td><td>Applicazioni settimanali di prodotti biotecnologici all’inizio di ogni sezione delle tratte fognarie interessate, in relazione agli abitanti equivalenti di ciascuna. Le applicazioni vengono eseguite manualmente nei pozzetti di ispezione.</td></tr>
<tr><td>Risultati ottenuti</td><td>Odori – Rimozione totale degli odori su tutta larete fognaria e nell’impianto di depurazione dopo 20 giorni.
Collettori – Normalizzazione della tratta fognaria, riduzione dei fanghi organici e disincrostazione delle amalgame (grassi-detergenti) dopo 30 giorni,
Acque reflue – normalizzazione della qualità delle acque reflue in ingresso all'impianto con eliminazione dei sovraccarichi e significativa riduzione della sostanza organica, come evidenziato dai principali parametri monitorati, di seguito riportati:
<table><tr><th>Parametri</th><th>Riduzioni</th></tr><tr><td>COD</td><td>- 34 %</td></tr><tr><td>Ammoniaca</td><td>- 45 %</td></tr><tr><td>Azoto Totale</td><td>- 31 %</td></tr><tr><td>Settle-able materials</td><td>- 55 %</td></tr></table></td></tr>
</table>

5) PRETRATTAMENTO DEI REFLUI CIVILI E TRATTAMENTO DELLE RETI FOGNARIE

Sito	Parte di un centro abitato in Provincia, per un totale di 28.000 abitanti equivalenti.
Tipologia del refluo	Reflui Civili
Tipo di trattamento	Pre Trattamento delle acque reflue e Trattamento delle reti fognarie. Inoltre in alcuni canali sono stati effettuati alcuni trattamenti per la regressione biologica dei sedimenti organici.
Problemi riscontrati	In questa parte della città i liquami vengono raccolti e inviati in fossi a cielo aperto che scorrono in torrenti aperti. ● Produzione di odori, in condizioni anaerobiche, di fenomeni di putrefazione e riduzione dei fanghi. Gli odori erano persistenti nel centro abitato nei tratti aperti finali e in relazione alle variazioni di pressione. ● Incrostazioni dovute ad agglomerati di grasso e detersivo ● Deposizione di fanghi organici sul letto dei fossi e dei torrenti. ● Elevato carico organico con conseguenze negative sull'ecosistema dei corsi d'acqua, trasformati in fognature a cielo aperto e produzione di cattivi odori.
Applicazioni	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Risultati ottenuti	**Odours –** Drastic reduction of odours along all the treated system after 20 days. **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 30 days **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** ● COD — - 58 % ● filtered COD — - 52 % ● Ammonia — - 52 % ● Total N — - 51 % ● Settle-able materials — - 70 % ● Organic matter on residue at 105° and 600° — - 76 %

6) Biotechnological treatment of sewer systems and waste water preliminary treatment

Site	Inhabited center in a coastal municipality, for a total of 4.000 equivalent inhabitants, present mainly in July and August.
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment. Plant deodorisation (see the specific card)
Found problems	The municipality isn't equipped with a complete waste water treatment plant but only with the grid, aeration and settling sections. The sewage are disposed in an undersea pipeline. - Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 10 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** • COD — - 36 % • NH_4-N — - 41 % • NO_2- — - 55 % • NO_3- — - 29 % • NO_3 –N — - 30 % • Surfactants — - 40 %

7) Biotechnological treatment of sewer systems and waste water preliminary treatment	
Site	Inhabited center in a coastal municipality, for a total of 300 equivalent inhabitants.
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment.
Found problems	- Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 10 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** • COD — - 36 % • Filtered COD — - 22 % • Settle-able materials — - 25 %

8) Biotechnological treatment of sewer systems and waste water preliminary treatment	
Site	Tourist site, for a total of 20.000 equivalent inhabitants, present mainly in July and August.
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment. Plant and pumping station Deodorisation (see the specific card)
Found problems	The site isn't equipped with a complete waste water treatment plant. - Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 15 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** • COD — - 72 % • BOD_5 — - 75 % • Settle-able materials — - 88 % • Ammonia — - 20 % • Total phosphorous — - 43 % • Surfactants — - 38 % • Fats and Animal and Vegetal Oils — - 58 %

9) Biotechnological treatment of sewer systems, septic tanks and waste water preliminary treatment

Site	Tourist site, for a total of 12.000 equivalent inhabitants, present mainly in July and August.
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of septic tanks of hotels and camping and of all the sewer system, sewage preliminary treatment
Found problems	- **Unpleasant odour production** after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. The odours were persistent in the inhabited center in the final open sections and in relation with pressure changes. - **Encrustations** due to fat and detergent agglomeration - **Organic sludge deposition** on the bed of the ditches and of the streams. - **High organic load** with bad consequences on the ecosystem of the water streams, transformed into open sewer systems and production of foul odours.
Application	Weekly applications of biotechnological products: - in advance of each section of the sewer system in relation with the drained E.I.; - in the septic tanks according to the present I.E. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 15 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** ● COD — - 55 % ● Filtered COD — - 15 % ● Settle-able materials — - 54 % ● H_2S — - 77 %

10) Biotechnological treatment of sewer systems and waste water preliminary treatment	
Site	Tourist site, for a total of 7.000 equivalent inhabitants, present mainly in July and August.
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment. Plant and system deodorisation (see the specific card)
Found problems	The site is equipped with an undersized treatment plant, placed on the beach. The waste waters are discharged in an undersea pipeline. - Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 7 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** • COD — - 42 % • Ammonia — - 32 % • Settle-able materials — - 42 %

11) Biotechnological treatment of sewer systems and waste water preliminary treatment	
Site	Tourist site, for a total of 1.000 equivalent inhabitants
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment. Plant deodorisation (see the specific card)
Found problems	The site is equipped with an undersized treatment plant in relation with the served meals. The waste waters are discharged into an undersea pipeline - Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 15 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** • COD — - 42 % • Ammonia — - 35 % • Settle-able materials — - 45 %

12) Biotechnological treatment of sewer systems and waste water preliminary treatment

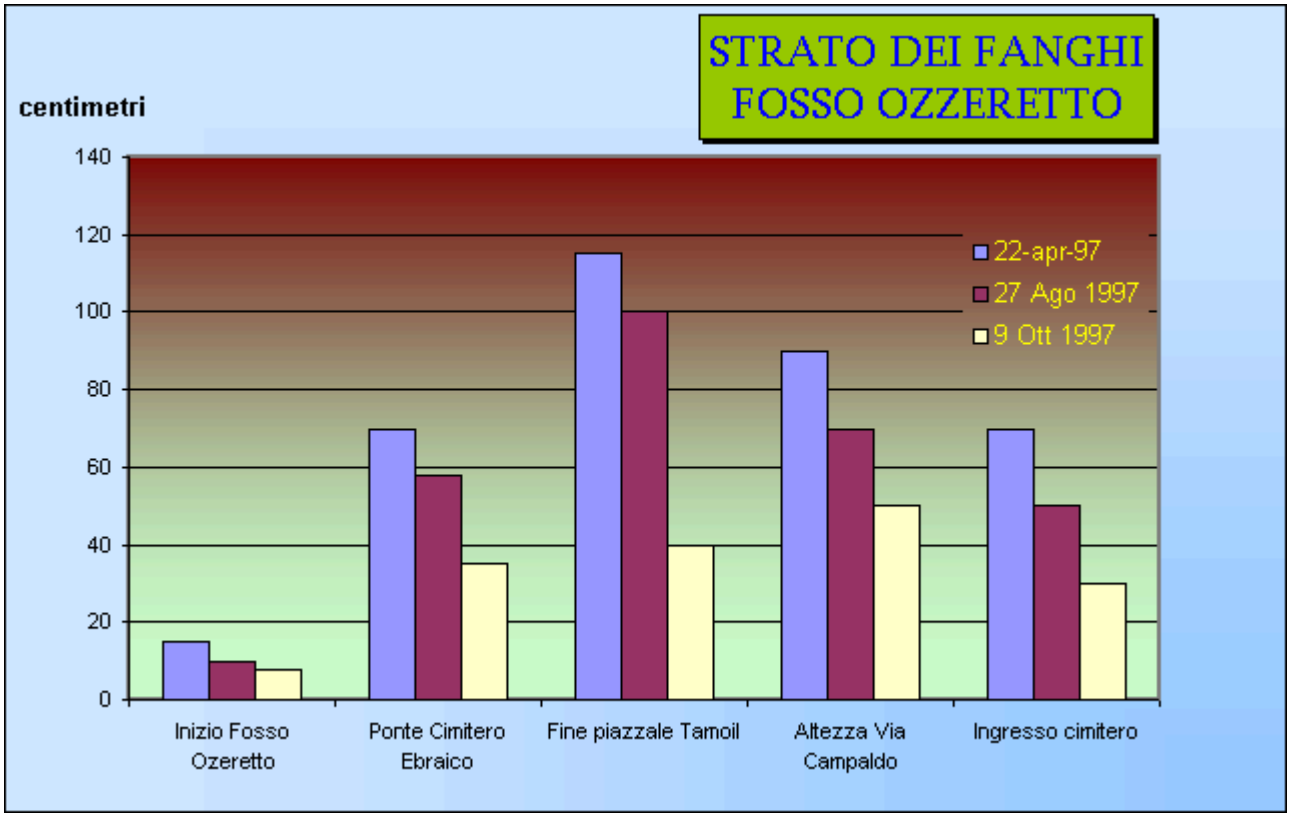
Site	Inhabited center in a coastal municipality, for a total of 5.000 equivalent inhabitants
Kind of treated waters	Municipal sewage
Kind of treatment	Treatment of sewer systems and sewage preliminary treatment. Pumping station deodorisation (see the specific card)
Found problems	The waste waters are discharged into a consortium sewer system and then into the treatment plant. - Unpleasant odour production after the start, in anaerobic conditions, of phenomena of sludge putrefaction and reduction. - Encrustations due to fat and detergent agglomeration with consequent reduction of the free section. - Organic sludge deposition with possible clogging and sewage flow back. - High organic load with consequent bad running of the waste water treatment plant.
Application	Weekly applications of biotechnological products in advance of each sewer system section in relation with the drained E.I. The applications are carried out manually in the manholes.
Obtained results	- **Odours –** Total removal of odours along all the treated system after 15 days. - **System –** Sewer system normalisation due to the total settled organic sludge and degradation and separation of amalgams (fats-detergents) after 20 days, with improvement in the flow and drastic reduction of emptying interventions. - **Waste waters –** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter, as put in evidence by the main monitored parameters, such as the following ones: **Parameters** — **Reduction** ● COD — - 38 % ● Ammonia — - 32 % ● Settle-able materials — - 32 %

13) Biotechnological treatment of waste water discharge lines on ships	
Site	Ships with a gravity discharge system, on which there are from 200 to 400 persons (crew and passengers).
Kind of treated waters	Municipal sewage
Kind of treatment	Sewer system treatment and sewage preliminary treatment. Deodorisation
Found problems	Frequent clogging of lines and emission of unpleasant odours by the discharges placed on the floor (limber holes). This troubles are generally solved by means of: - Burning of pipeline sections and successive acid washing; - Dismantling of pipeline suctions and cleaning by means of external hammering and swabbing. These procedures require the impracticability of the interested services and a lot of personnel to carry out the intervention.
Application	Weekly application of biotechnological products directly in the hygienic services and in the kitchen discharges, in relation with the served inhabitants. The applications are carried out manually.
Obtained results	- **Lines –** Line normalisation due to the degradation and separation of amalgams (fats-detergents), formation of a protective biofilm on all the surface of the pipes, in order to prevent the formation of new encrustations. At the end of the treatment, during which there hasn't been any trouble, in order to verify the treatment efficacy the personnel have stripped down sections of pipes observing the absolute absence of encrustations and of corrosions both on the steel parts and on the rubber gaskets. - **Odours –** drastic reduction of odour until disappearance, that can be observed in the limber holes and in the sinks. - **Waste waters -** normalisation of the quality of waste waters entering the plant with elimination of overloads and significant reduction of the organic matter.
Conclusions	- Drastic reduction of need of personnel that carry out the maintenance of waste water discharge lines, both for the emergency and ordinary interventions. - Better repair of pipes that aren't any more subject to the strong stress produced by the mechanical cleaning. - Continuity in the service practicability.

Results obtained in 1997

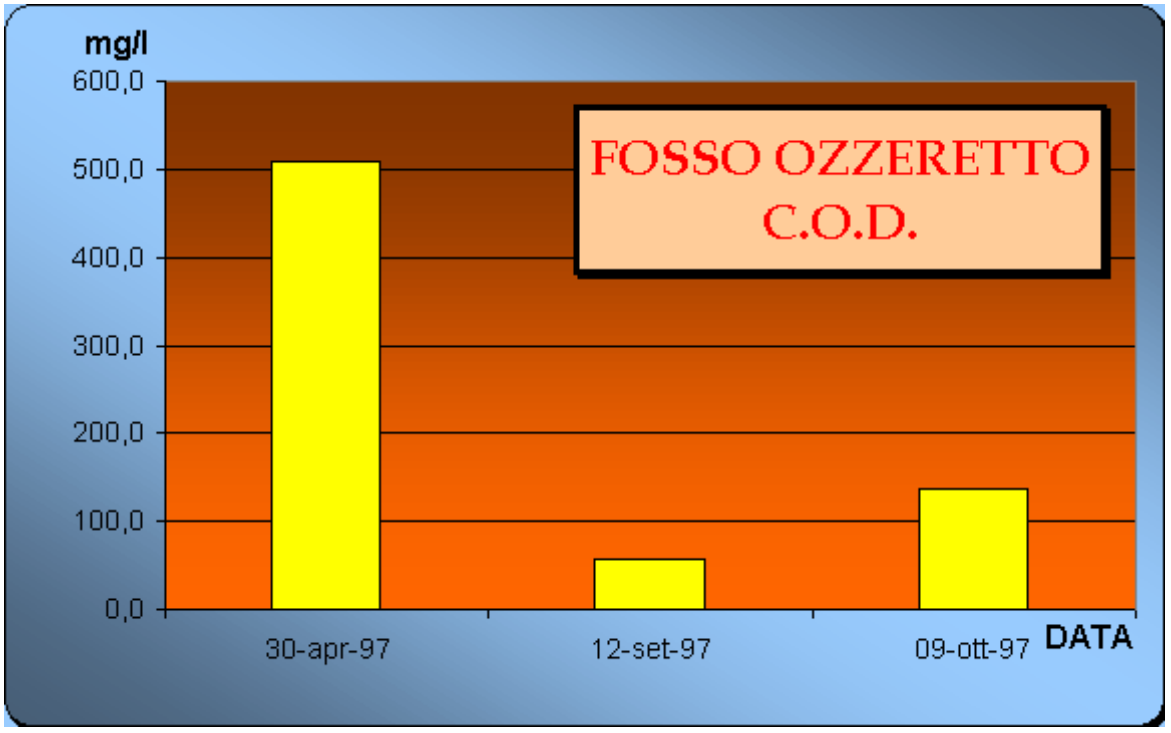
The measurements on the **sludge layer** in the Ozzeretto ditch, performed during the treatment, show an evident and significant reduction:

SAMPLING SITE	SLUDGE LAYER			
	22 Apr 1997	27 Ago 1997	09 Oct 1997	DIFFER.
Beginning of the Ozeretto ditch	15	10	8	-7
Jewish Cemetry bridge	70	58	35	-35
End part of the Tamoil large square	115	100	40	-75
At the height of Campaldo street	90	70	50	-40
Cemetery entrance	70	50	30	-40



The analysis performed on the waters drawn in the Ozzeretto ditch, even if limited, have put in evidence also a significant reduction in the value of some parameters such as COD, Total and Ammonia Nitrogen, Organic substances at 105°C and 600°C

SAMPLING DATE	ANALIZED PARAMETER				
	C.O.D.	N tot	NH4	R 105°C	R 600°C
30-apr-97	509,0	56,5	22,5	682,0	430,0
12-set-97	56,0	41,0	18,0	152,0	62,0
09-ctt-97	138,0	27,5	12,0	140,0	54,0



Results obtained in 1998

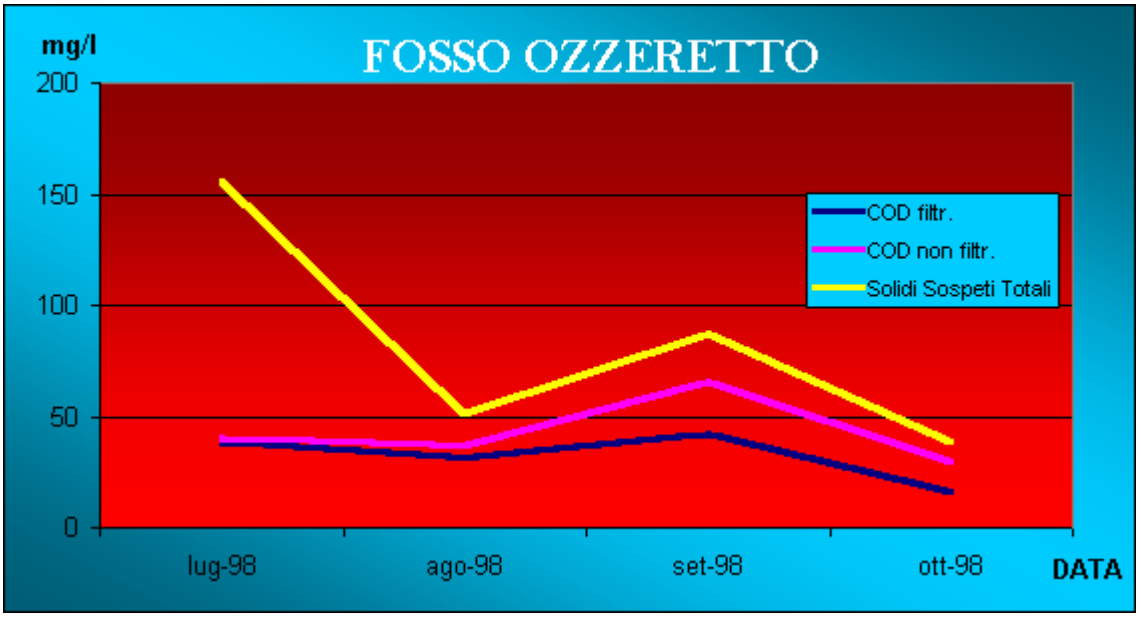
After the experience developed during the first treatment, i.e. during the summer in 1997, and on the basis of the encouraging obtained results, the Municipal Administration has entrusted again the Idrabel Italia S.p.A. company with another treatment to be performed during the summer in 1998 and precisely in the period comprised between July and November 1998.

This new treatment has regarded some municipal ditches that flow then in the Ozzeretto ditch, and the check on the quality of the waters running in the Ozzeretto ditch.
The results observed on the Ozzeretto ditch have put in evidence a significant reduction in the polluting parameters, such as COD, Suspended Solids, total N and NH_4.

COD - Total Suspended Solids

The degradation of the organic compounds, carried out by the micro organisms, has produced a significant reduction in the filtered and not filtered COD together with the total suspended solids.

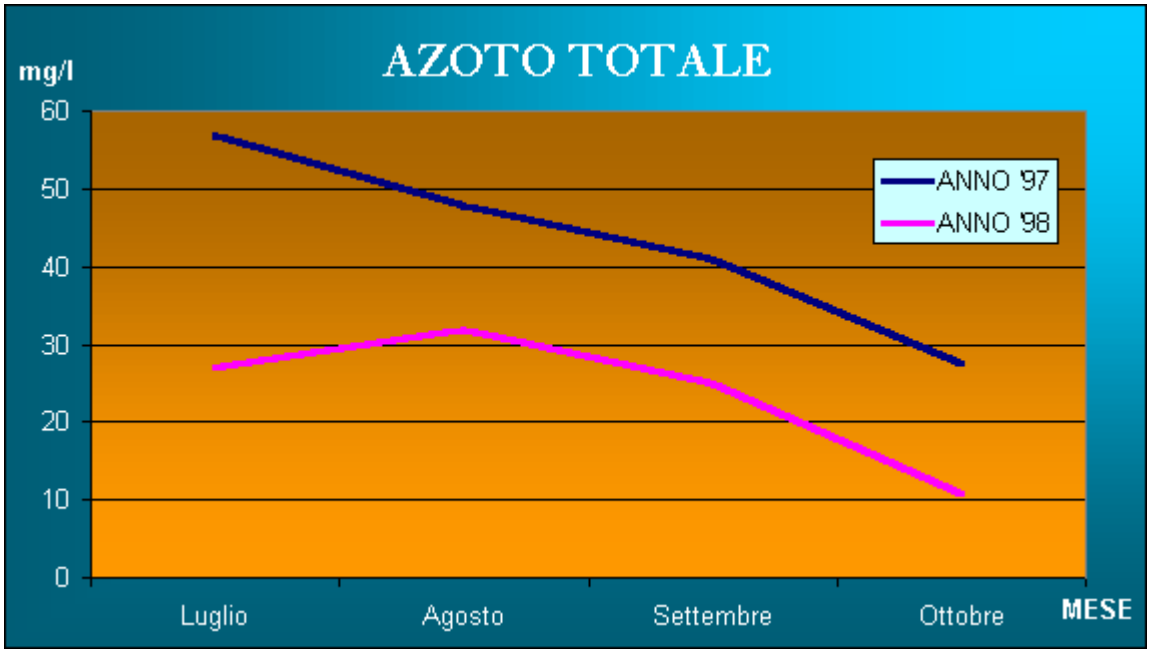
PARAMETERS	OZZERETTO DITCH			
	14 Lug 1998	17 Aug 1998	17 Sept 1998	26 Oct 1998
Filtered COD mg/l	38,8	31,8	42,1	16,6
Not filteredCOD mg/l	40,8	36,6	65,4	29,9
Total Suspended Solids	156,0	51,0	87,0	39,0



Total N - NH_4

The analysis carried out before and during the treatment put in evidence a reduction in the total N (tot N) and in the ammonia N (NH_4), corresponding respectively to the 60% and to the 56% as it is shown in the following table and graph.

YEAR	• OZZERETTO DITCH			
	Juky	August	September	October
'97	57,0	48,9	41,0	27,5
'98	27,1	31,9	25,1	10,8



As it is possible to see in the graph, the total N in the '98, beyond diminishing during the treatment, shows values that are lower than those ones observed during the treatment performed in the 1997

In general also the unpleasant odours have diminished as it is demonstrated analytically by the transformation and reduction in organic nitrogenous compounds and in the ammonia nitrogen, and olfactively by the testimonies of the inhabitants living in the area near the Ozzeretto ditch.
We can so declare that the improvements obtained during the treatment performed in 1997 haven't disappeared and add to those ones obtained in 1998, producing further benefits.