

水資源整合廠商經驗分享

尚穩環保科技(股)公司台南廠

報告人：許勝嘉 廠長

中華民國108年11月7日

塑膠 回收再利用，地球 資源永循環

Plastics Recovery Perpetuates The Earth



簡報大綱

- 公司簡介
- 循環經濟-區域水資源整合模式
- 供/受水端用水狀況
- 水資源整合規劃
- 後續工作



Briefing of Company / 公司簡介

Sunny Environmental Consultants, Ltd., the EPA approved professional recycling plastic containers treatment factory and top quality recycled plastics supplier, was founded in 1999. Tainan totally occupied 18,000 m² were established in specialized production of recycled PET、PE、PP、PS、PVC scraps in past ten years.

Administration and sales is responsibly run in Taipei office. Our sales markets include China, Taiwan, Southeast Asia, Middle East and America. The amount of recovered waste each year not just effectively reduces the landfill load in Taiwan, but also regenerated to high quality plastic feedstock.

尚穩環保科技股份有限公司成立於西元1999年，為環境保護署核准設立，管理輔導之塑膠容器再生處理廠商，目前設有台南廠，佔地總面積約為180公畝，生產PET、PE、PP、PS、PVC等各類塑膠再生碎片，並由台中公司負責行政業務及進出口貿易工作，行銷市場涵蓋中國、台灣、東南亞、中東及美洲，除了大大減輕廢棄物衛生掩埋場之負荷外，更將有限的塑膠資源永續循環利用，對社會環境提供實際貢獻。

■ COMPANY INFORMATION

Company set-up year	1999
SOE or Private Owned	Private owned
Employee Size	80
Total Revenue in 2017	14 milion (USD)
Major Pooducts	PET/PE/PP scraps
Major Pooduct Sales	80% ; Major Markets : USA / Taiwan
	Export : 50% / Local : 50%
Largest Input Capacity	2400 mts/mon. for PET (output : 2000 mts/mon.) 1200 mts/mon. for PE/PP/PS/PVC (output : 1300 mts/mon.)

Our Business Doctrinism / 我們的經營理念

Committed to be a professional recycling plastics manufacturer and supplier. We promise to provide quality-stable, supply-stable recycling plastics in combination with our customers' needs and growth.

致力為塑膠再生原料專業製造廠及供應商，配合客戶需求與成長，提供品質穩定、供應量穩定之塑膠再生原料。

Dedicated to community contribution and environmental protection. We promise to sustain our efforts on environmental policies and resource recovery.

致力社會與環境貢獻，持續配合環境保護政策，推動資源回收處理工作。



- *For the audit, the monitor system is connected to the EPA all days.
- *If the monitor system is out of work , the factory will stop the production and inform the EPA immediately.
- * Alternative monitor system in case of the original one out of work.
- * Uninterruptible Power Supply System & Alarm System

- 24小時與環保署錄影資料即時連線，提供稽核與認證追查
- 發現停止錄影立即申報,停止錄影期間不得生產
- 預防監視錄影系統當機,攝影機與監視系統共兩套
- 不斷電系統，警報系統。

國際標準化組織

ISO 9001 : 2015 品質管理標準

ISO 14001 環境管理標準

Certificate

Standard **ISO 9001:2008**

Certificate Registr. No. 01 100 085194

TÜV Rheinland Cert GmbH certifies:

Certificate Holder: **Sunny Environmental Consultants, Ltd.**
No. 2, Gongye W. Rd., Guantian Dist.,
Tainan City 72048, Taiwan (R.O.C.)

Scope: Recycling and Treatment of Waste Plastic Vessels and PET Pellet Creating

An audit was performed, Report No. 085194. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 13-11 (dd.mm).

Validity: The certificate is valid from 2012-01-29 until 2014-12-21.
First certification 2008

2012-01-29

J. Ulrich
TÜV Rheinland Cert GmbH
Am Grauen Stein - 51105 Köln


DGA-ZM-58-95-00

www.tuv.com

 **TÜVRheinland®**
Precisely Right.

Certificate TW09/00445

The management system of

SUNNY Environmental Consultants, Ltd.
尚穩環保科技股份有限公司

No. 2, Gongye W. Rd., Guantian Township, Tainan County, Taiwan
720 台南縣官田鄉二鎮村官田工業區工業西路2號

has been assessed and certified as meeting the requirements of

ISO 14001:2004

For the following activities

Recycling and treatment of waste plastic vessels.
廢塑膠容器回收與處理

This certificate is valid from 23 September 2009 until 23 September 2012
and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 25 August 2012
Issue 1. Certified since 23 September 2009

Authorised by

R. J. S.

SGS United Kingdom Ltd Systems & Services Certification
Rossmore Business Park, Ellesmere Port, Cheshire CH65 3EN UK
t+44 (0)151 350-6666 f+44 (0)151 350-6600 www.sgs.com

SGS EMS 04 0105

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UKAS
ENVIRONMENTAL
MANAGEMENT
005



GMPS (Green Product Management System)

綠色產品管理系統 國際電子零件認證制度 (IECQ) 危害物質過程管理要求

Certificate TW09/00378

The management system of

SUNNY Environmental Consultants, Ltd.
 尚穩環保科技股份有限公司

No. 2, Gongye W. Rd., Guantian Township, Tainan County, Taiwan
 720 台南縣官田鄉二鎮村官田工業區工業西路2號
 has been assessed and certified as meeting the requirements of

Green Product Management System – Requirements for Hazardous Substance Process Management(GPMS-HSPM)
TEEMA-S-GPMS-080000:2006

For the following activities

Manufacture of plastic material.
 塑膠材料製造

Further clarifications regarding the scope of this certificate and the applicability of GPMS requirements may be obtained by consulting the organization

This certificate is valid from 26 August 2009 until 26 August 2012 and remains valid subject to satisfactory surveillance audits.
 Re certification audit due before 23 July 2012
 Issue 1. Certified since 26 August 2009
 Authorised by 

SGS Taiwan Ltd. Systems & Services Certification
 136-1, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan
 t +886 (0)2 2299 3939 f +886 (0)2 2299 3231 www.sgs.com

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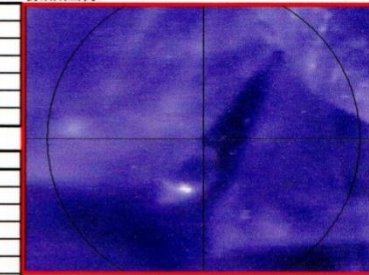

尚穩環保科技股份有限公司
 RoHS定量結果報告書

SII NanoTechnology Inc.
 QP73-03-02

樣品訊息

測定日期	2009/6/16 16:46		
菜單	塑膠測試		
品名	瓶片		
品號	a3		
批號	測試2		
操作者	DAN		
備註			

樣品圖像



測定條件

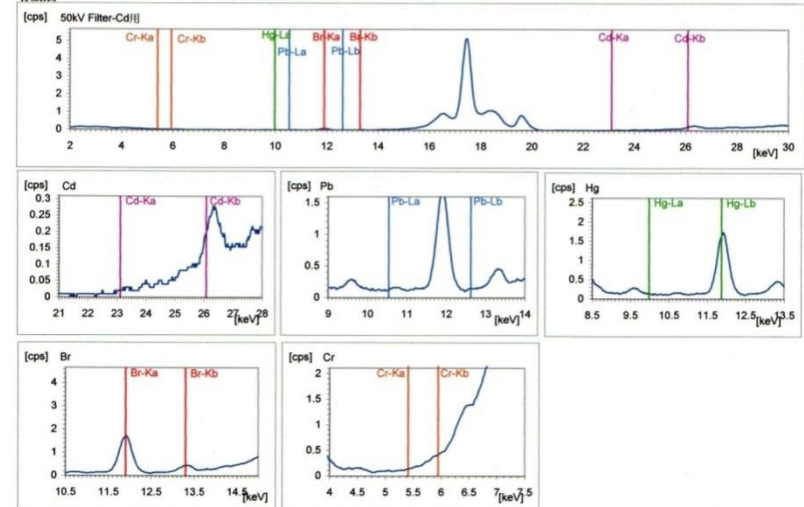
	1st	2nd	3rd	4th
測定時間(sec)	100	100	100	
無效時間(%)	31	3	19	
管電壓(kV)	50	50	15	
管電流(uA)	822	1000	1000	
濾波器	Pb用	Cd用	Cy用	
機型	SEA1000A ID1284 (Ver. 8.08.2.0)			
準直器	圓窗5.0mm			
大氣環境	充氮			
測定方法	塊體分析(檢量線) C:\XRAY\ANA\p1000-09-02-			
備註				

分析結果

綜合判定	OK					
N sigma	3					
	濃度 (ppm)	濃度判定	統計誤差 3s(cps)	統計誤差 判定	X射線強度 (cps)	強度誤差 3s(cps)
Cd	5	OK	16	----	0.1	0.4
Pb	0	OK	2	----	0.1	1.2
Hg	0	OK	2	----	0.0	0.0
Br	25	OK	10	----	4.4	1.7
Cr	0	OK	5	----	0.0	0.0
Cl	0					

共存元素						
濃度 (wt%)						

能譜



複核 _____ 檢驗者 _____

Control Union GRS (Global Recycle Standard)

全球回收標準驗證

Control Union Certifications
P.O. Box 161, 8000 AD Zwolle, The Netherlands
http://www.controlunion.com
tel.: +31(0)38-4260100

CERTIFICATE OF COMPLIANCE
(Scope Certificate)

CERTIFICATE No: CU816597GRS-01.2016
REGISTRATION No: CU 816597

Control Union Certifications declares that
Sunny Environmental Consultants, Ltd.
No. 2088, Sec. 4, Taiwan Blvd., Xitun Dist.,
Taichung City, 407
TAIWAN

has been inspected and assessed according to the
Global Recycle Standard (GRS)
Version 3.0

and that products of the categories as mentioned below (and further specified in the annex) comply with this standard:
Chips, Flakes

Processing steps / activities carried out under responsibility of the above mentioned company (by the operations as detailed in the annex) for certified products
Exporting, Importing, Processing (Chips), Processing (Flakes), Trading

This certificate is Valid until: 25 May 2017

Place and date of issue:
Colombo-07, 03 June 2016

Name of authorised person

On behalf of the Managing Director
Miss H.M.U.K. Herath
Certifier

Stamp of the issuing body


Standard's Logo


This certificate cannot be used as a transaction certificate.
The issuing body can withdraw this certificate before it expires if the declared compliance is no longer guaranteed.

Certificate of Compliance, Page 1 of 3

Control Union Certifications
P.O. Box 161, 8000 AD Zwolle, The Netherlands
http://www.controlunion.com
tel.: +31(0)38-4260100

Annex to certificate no.: CU816597GRS-01.2016
Sunny Environmental Consultants, Ltd.
Global Recycle Standard (GRS)
In specific the certificate covers the following products:

Product code	Name of product and Material composition	Label grade	Processing Unit
P 122399	Chips : Chips - 100% Post-consumer Recycled Polyethylene Terephthalate	Post-Consumer	PRC 023929, PRC 023993
P 122282	Flakes : Flakes - 100% Post-consumer Recycled Polyethylene Terephthalate	Post-Consumer	PRC 023929, PRC 023993

Place and date of issue:
Colombo-07, 03 June 2016

Stamp of the issuing body


Standard's Logo


Name of authorised person

On behalf of the Managing Director
Miss H.M.U.K. Herath
Certifier

Certificate of Compliance, Page 2 of 3

■ PET

Recycled PET scraps and PET chips are our major products. We experienced constantly improvement in production flows as well as management in combination with customers' needs and growth for past years and gained high evaluation both in good quality and commercial credit.

PET各級再生碎片及酯粒為本公司專精之大宗產品，歷年來不斷配合客戶需求，改良生產製程與內部管理，品質及穩定性獲得客戶極高評價。

Source of recovery / 原料來源

PET containers, includes soft and carbonated drinks and mineral water bottles.

碳酸飲料及礦泉水瓶等各類PET容器。

Wastewater Treatment / 廢水處理



Markets / 市場運用

- Polyester Monofilament : used for zipper coils instead of polyamide material.
拉鍊單絲：可取代尼龍拉鍊。
- Polyester Fiber : used for grades of staple fiber such as conjugated and hollow fiber.
聚酯棉：三維棉、中空棉、填充棉等各級化纖聚酯棉。
- PET Sheet : used for packaging instead of PS、PVC material
薄板(膠片)：可經真空成型加工為各式包裝材，並可取代PS、PVC等舊有包材。
- PET Strap : instead of traditional steel strapping to avoid rust contamination and safety issues.
打包帶：可取代傳統鐵線打包，避免產生銹蝕污染及操作安全顧慮等困擾。
- Non-woven Fabrics : used of domestic and industrial textiles.
不織布(無紡布)：可作為各類民生及工業用布材。
- PET Chips : PET scraps can be regenerated to recycled PET chips for different needs.
再生酯粒：再生碎片可再經抽粒加工為PET再生酯粒，以因應客戶不同之原料需求。

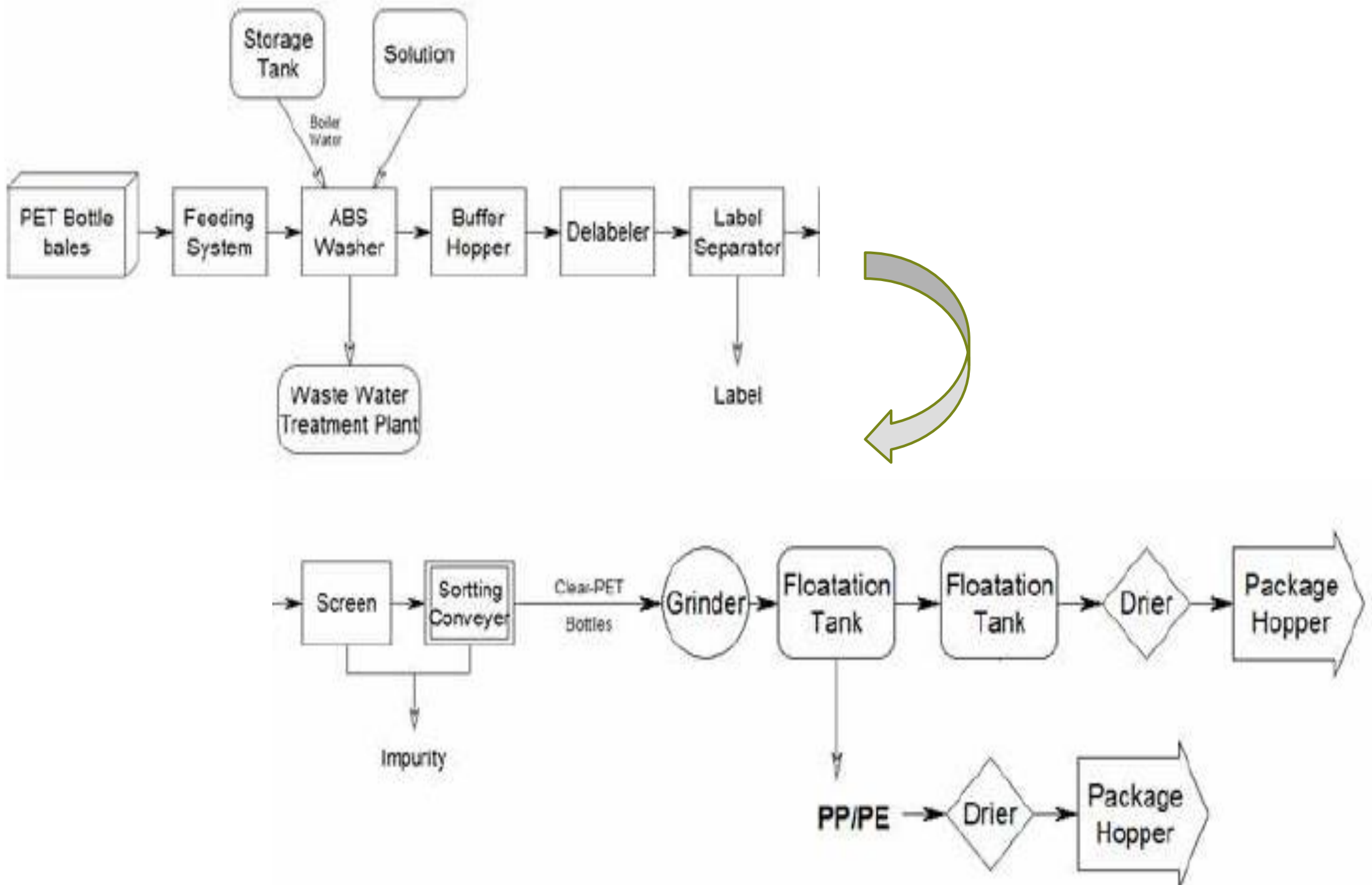
Other mono- or compound plastic for domestic and industrial products.

其它塑膠製品：可取代傳統單一或複合材質之民生與工業用塑膠製品。

End products made of recycled PET scraps



Process of PET Bottle Flake



STORAGE OF PET BOTTLE BALES



PET LINE / FEEDING SYSTEM



Roof of Solar Power Energy



PET LINE / SORTING & METAL DETECTOR



- Sorting process operated in bright condition
- The ergonomics of production procedure to reduce the occupational injury
- The comfortable work conditions
- Aerial filter, PM 2.5 monitoring
- Emergency lighting & Escape routes

- 分類作業環境明亮清爽
- 動作力學設計降低職業傷害
- 溫溼度控制於舒適環境
- 空氣過濾，PM2.5監視
- 緊急照明，逃生路線

PET LINE / PACKAGE HOPPER



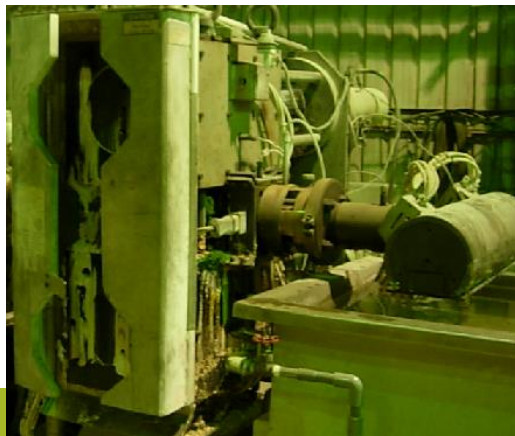
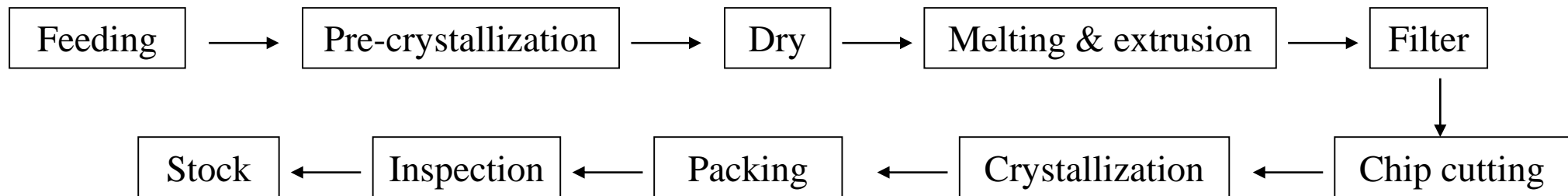
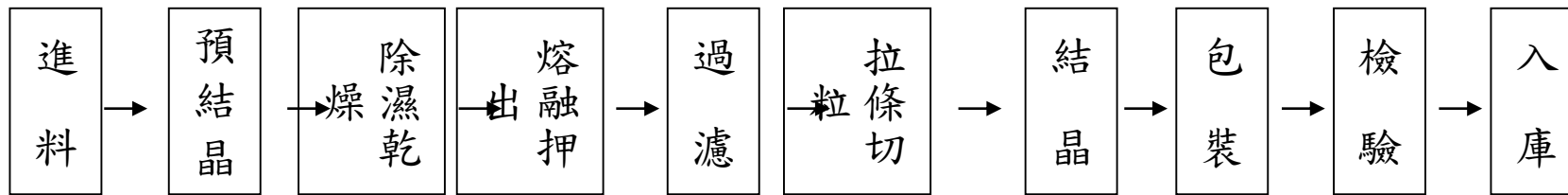
INDOOR STORAGE OF PRODUCT (FLAKES)



GRADES OF PET FLAKES



酯粒生產流程/Process of Rec. Pellets



PRODUCT DATA SHEET / 產品物性表

尚穩環保科技股份有限公司

Sunny Environmental Consultants, Ltd. <http://www.sunnytw.com.tw>
Tel: 886-4-23597089 Fax: 886-4-23591596 e-mail: sunnytw@mail.or.com.tw
407 台中市西屯區中港路三段 266-1 號

產品物性表 PRODUCT DATA SHEET

Product Name : PET-AC (recycled PET chips)

物性項目 Characteristics	數 值 Value
1. 固有黏度 IV Intrinsic Viscosity	0.70 ± 0.01
2. 色 值 (b) b Color b Value	-1.5 ~ +5
3. 色 值 (L) L Color L Value	75 > L > 45
4. 酸 價 (COOH) meq/kg (Carboxyl Group)	≤36
5. 灰 份 % Ash	0.32
6. 二 甘 醇 (DEG) % Diethylene Glycol	1.5
7. 熔 點 ℃ Melting Point	245 ± 5
8. 粒 徑 mm Chip Size	3*1.8*2.5

備註:

- 再生鹵粒可作為 PET 薄板、打包帶、長纖及其他需求較高品質回收原料之產品。
Recommended as raw material for PET sheet, strap, filament and products of higher quality needs.
- 以上數據為平均值，僅提供作為參考。
This data sheet provides average test values, which are only for referential use.
- 產品需求如網目、透明、或特殊色澤等需求，應於訂製前提出。
Please indicate specific need of chips like mesh size, transparency or particular color before all orders.

Issued in January, 2018

尚穩環保科技股份有限公司

Sunny Environmental Consultants, Ltd. <http://www.sunnytw.com.tw>
Tel: 886-4-23597089 Fax: 886-4-23591596 e-mail: sunnytw@mail.or.com.tw
407 台中市西屯區中港路三段 266-1 號

產品物性表 PRODUCT DATA SHEET

Product Name : PET-A & PET-M Flakes

Color : Clear , Mixed

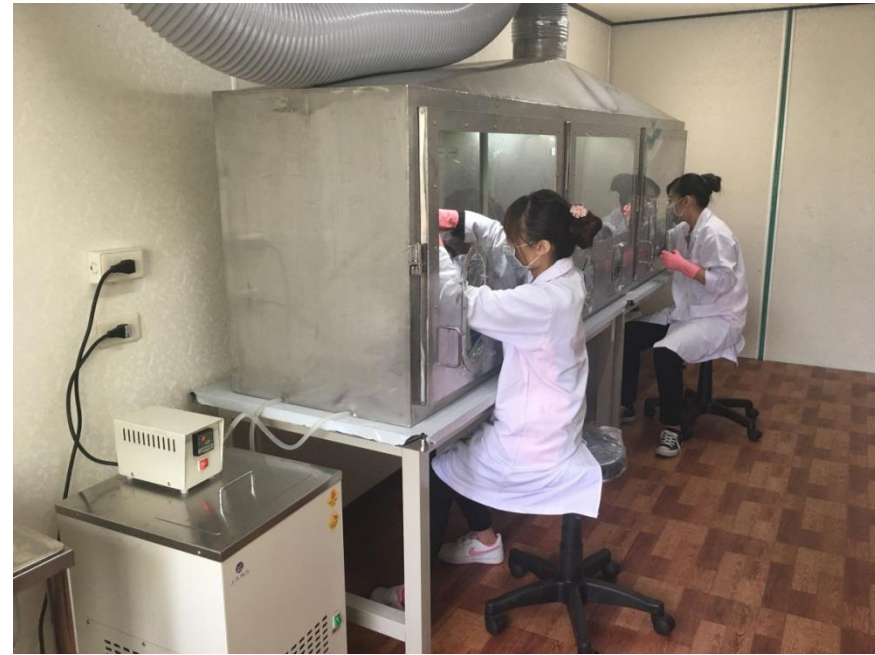
物性項目 Characteristics	數 值 Value
1. 固有黏度 at 25℃ Intrinsic Viscosity	0.71~0.75
2. 水份 Max. % Moisture	1.0
3. 假比重 g/cm ³ Bulk Density	0.4±0.05
4. PVC 含量 Max. ppm PVC Content	10
5. 金屬 Max. ppm Metal	10
6. 懸浮固體 (如 PE、PP、Glue) Max. ppm Floatable Contamination (i.e. PE、PP)	40
7. 總雜質 (包括 4-6 項及其它雜質) Max. ppm Total Impurity (include item 4-6 and other contamination)	100
8. 粒 徑 >10mm Max. % <1 mm Max. % Particle Size	2.5 1.0

備註:

- 再生鹵粒可作為 PET 薄板、打包帶、長纖及其他需求較高品質回收原料之產品。
Recommended as raw material for PET sheet, strap, filament and products of higher quality needs.
- 以上數據為平均值，僅提供作為參考。
This data sheet provides average test values, which are only for referential use.
- 產品需求如網目、透明、或特殊色澤等需求，應於訂製前提出。
Please indicate specific need of chips like mesh size, transparency or particular color before all orders.

Issued in January, 2007

品質檢驗/Quality Control



檢驗項目：

酯粒：IV(黏度)，產品尺寸，雜質檢測，合格判定，品質分類。

瓶片：假比重，含水率，雜質，合格判定，品質分類。

品質分類判定，品質異常通知，出貨管制確認。

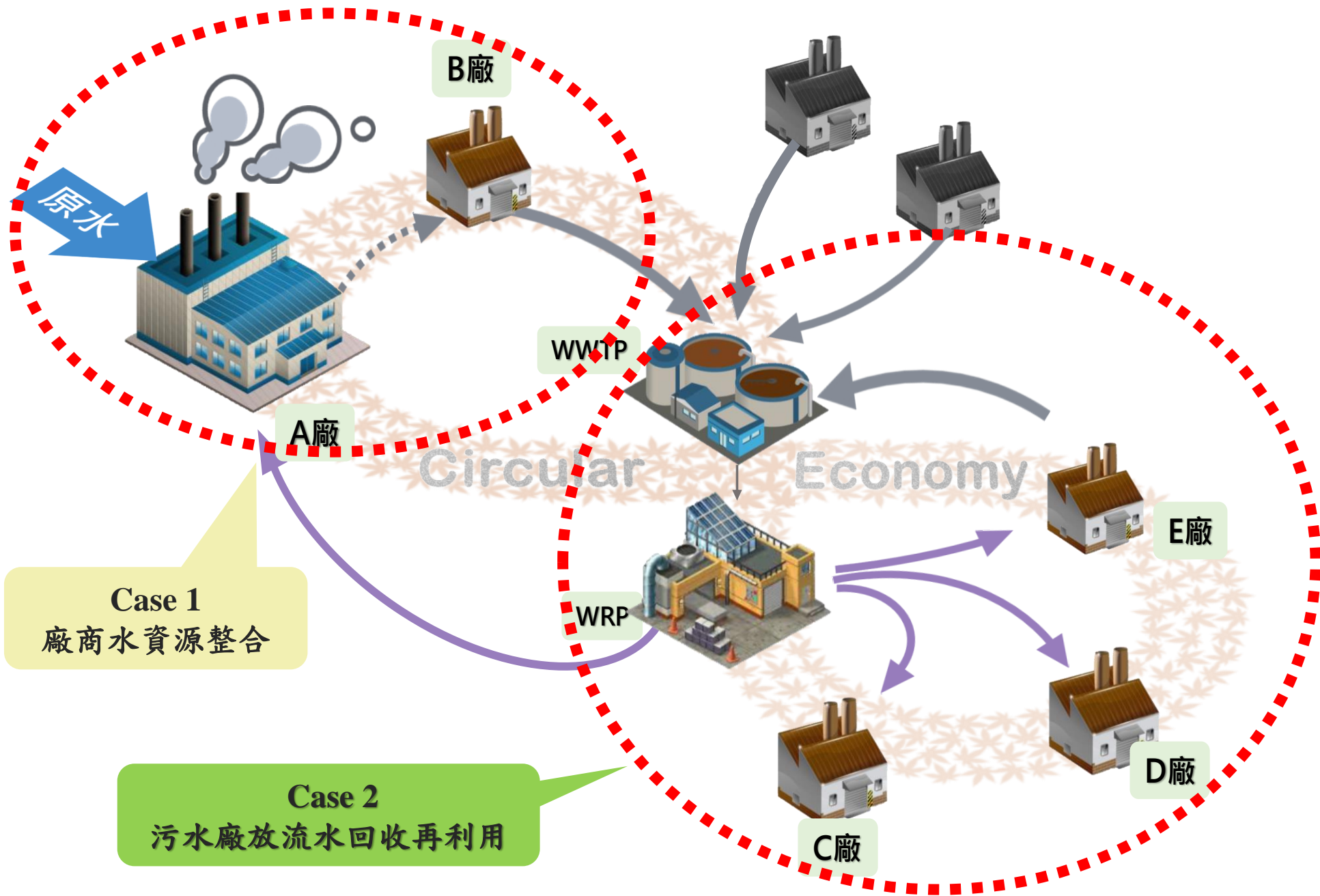
QC items:

Chip: IV, size, Impurities examination, qualification, grading.

Flake: apparent specific gravity, Water content, impurities, qualification, grading

Grade, Notification of quality abnormality, Ship control

循環經濟-區域水資源整合模式



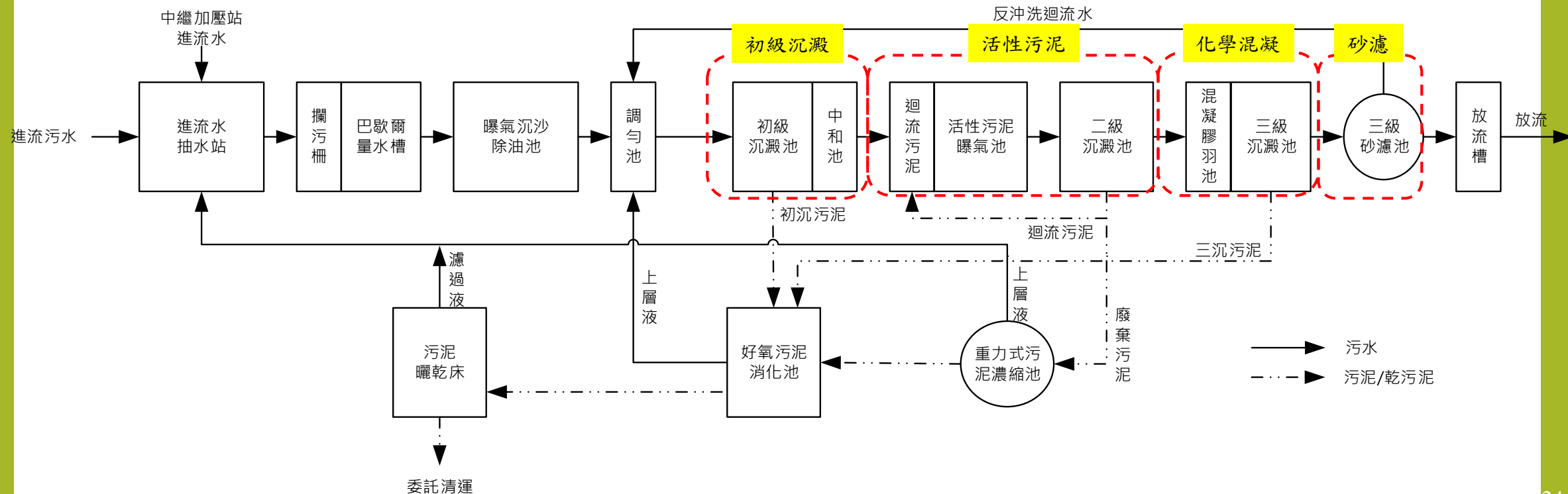
本區域水資源整合案屬於Case2 污水廠放流水回收再利用模式

供水端基本資料

■供水端：官田工業區污水處理廠，每日排放水量約**4,700 CMD**

■處理流程：初級沉澱、活性污泥、化學混凝處理、砂濾

■排放水質：COD平均47.7 mg/L、SS平均12.1 mg/L、導電度平均3,795 $\mu\text{S}/\text{cm}$ ，**優於放流水標準**，可回收再利用。



受水端基本資料

■ **受水端**：尚穩環保科技(股)公司台南廠，每日取水量約**373 CMD**

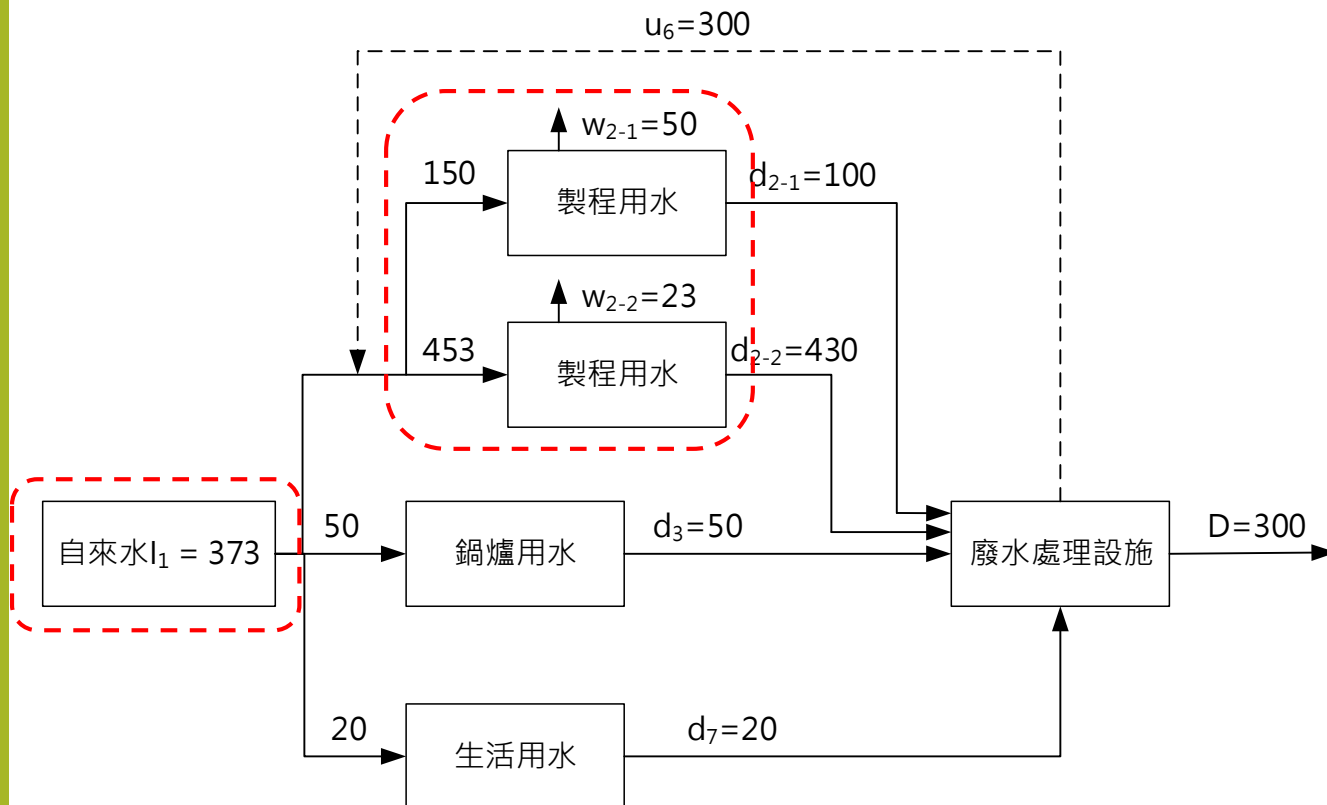
■ **主要用水單元**：製程前段清洗水

■ **用水水質要求**：符合放流水標準

■ **優勢**： a.兩廠鄰近，管線鋪設距離短(<100公尺)

b.已具有儲水桶

c.供水端具有水質監控，可確保用水端水質。

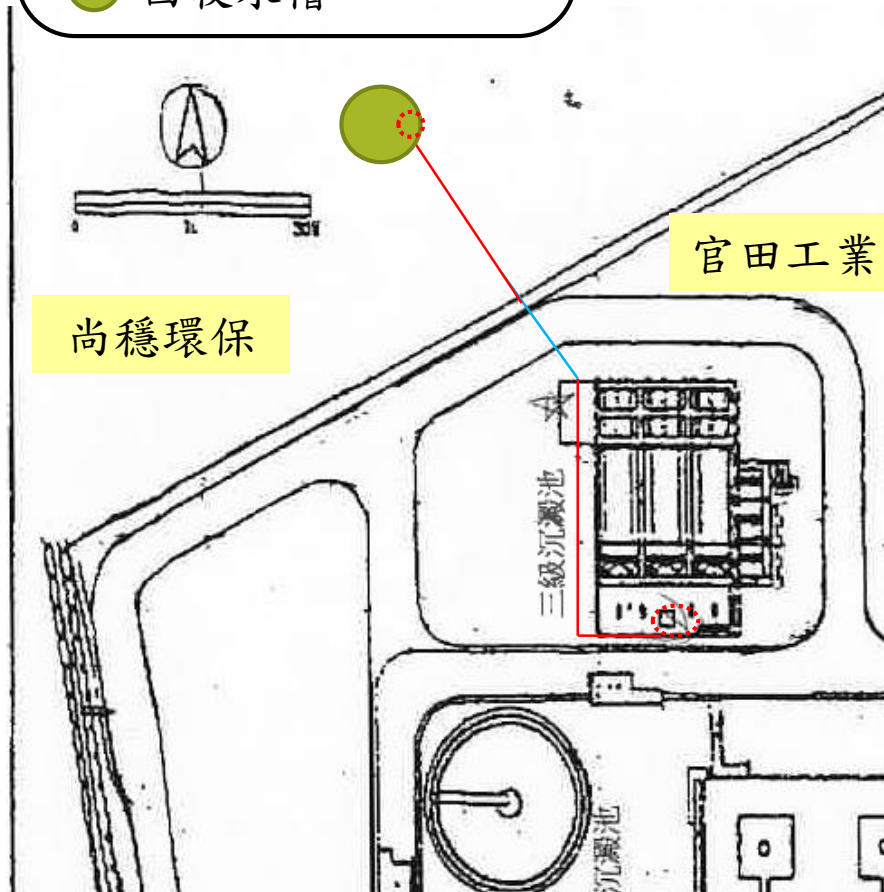


水資源整合規劃

■官田工業區污水處理廠提供符合標準之**放流水100 CMD**，供本公司作為製程前段清洗水使用，可**減少自來水使用**，達到**水循環再利用之目標**。

圖示

- 回收管線接水點
- 回收水管線
- 回收水管線(需開挖)
- 回收水槽



● 官田工業區污水廠接水點：
三級沉澱池旁之回收水管線(使用放流水)

● 尚穩環保之接水點：
廠內回收水槽

說明：

- 1.回收管材以PVC、3吋管做鋪設
- 2.官田污水廠內的回收管線分兩個部份
(1)以附掛方式40 m
(2)廠區道路及綠帶部分需開挖約5 m
- 3.尚穩環保廠內之回收管線鋪設約20 m，以附掛方式
以避免開挖為主

水資源整合規劃

供水端：官田工業區污水處理廠

- 於接水點後設置**流量計及電動閥**
- **電動閥**連接放流水**水質水量自動監測數據訊號**，若水質不符受水端需求，即自動關閉電動閥、停止供水。
- 水措變更敘明放流水流向及回收水量

受水端：尚穩環保科技(股)公司台南廠

- 設置回收水專用貯存桶**1**個。
- 貯存桶前設置**累計流量計**紀錄回收水使用量。
- 水措變更敘明回收水流向及使用量。

水資源整合規劃

- 初估經濟效益分析(年)

支出費用(元)	
建置(初設)成本	115,000
營運成本	96,771
節省費用(元)	
自來水費	390,000

- 註：1.建置成本包含管線、馬達施工費用、水措變更費用
2.營運成本包含：管線、馬達營運、公共設施使用費、污水廠馬達電費
3.開工日數以312天計算
4.自來水費單價以12.50元/噸。

- 第一年可得**178,229元**
- 第二年之後可得**293,229元**。

後續工作

- 申請變更許可後，本公司後續辦理回收水管線公共用地；附掛申請及工程施作等事宜。
- 完工後經相關單位現勘審查，核發許可後，通水回收再利用。

敬請指教

感謝經濟部工業局「產業用水效能提升計畫」提供產業諮詢與輔導，及感謝財團法人環境與發展基金會輔導團隊協助推動本區域水資源整合案，並協助本廠後續規劃工作之推動。