Selecting, Collecting, and Evaluating CMS Program Performance Metrics

Chemical Strategies Partnership
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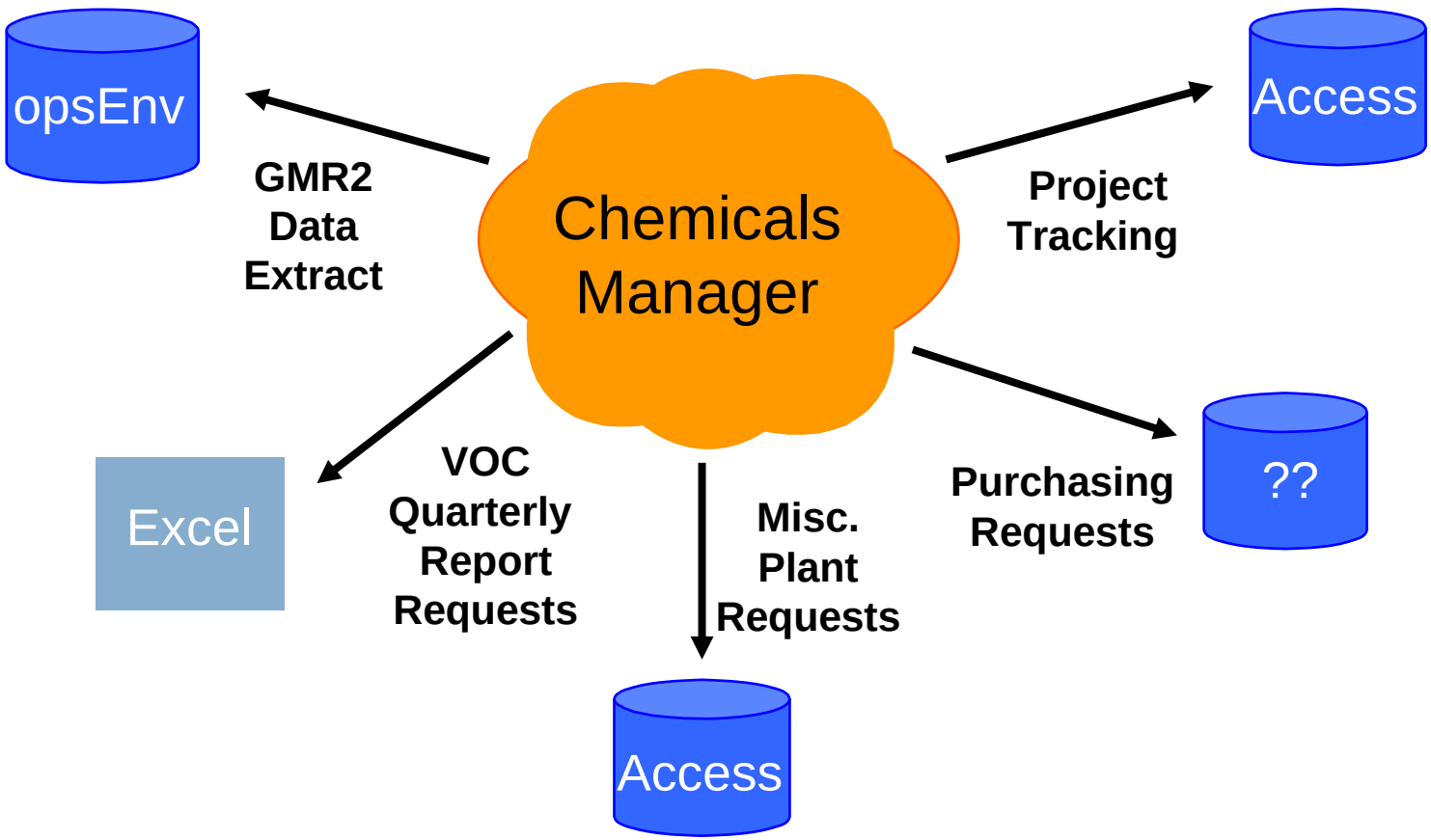
Chemical Management Systems

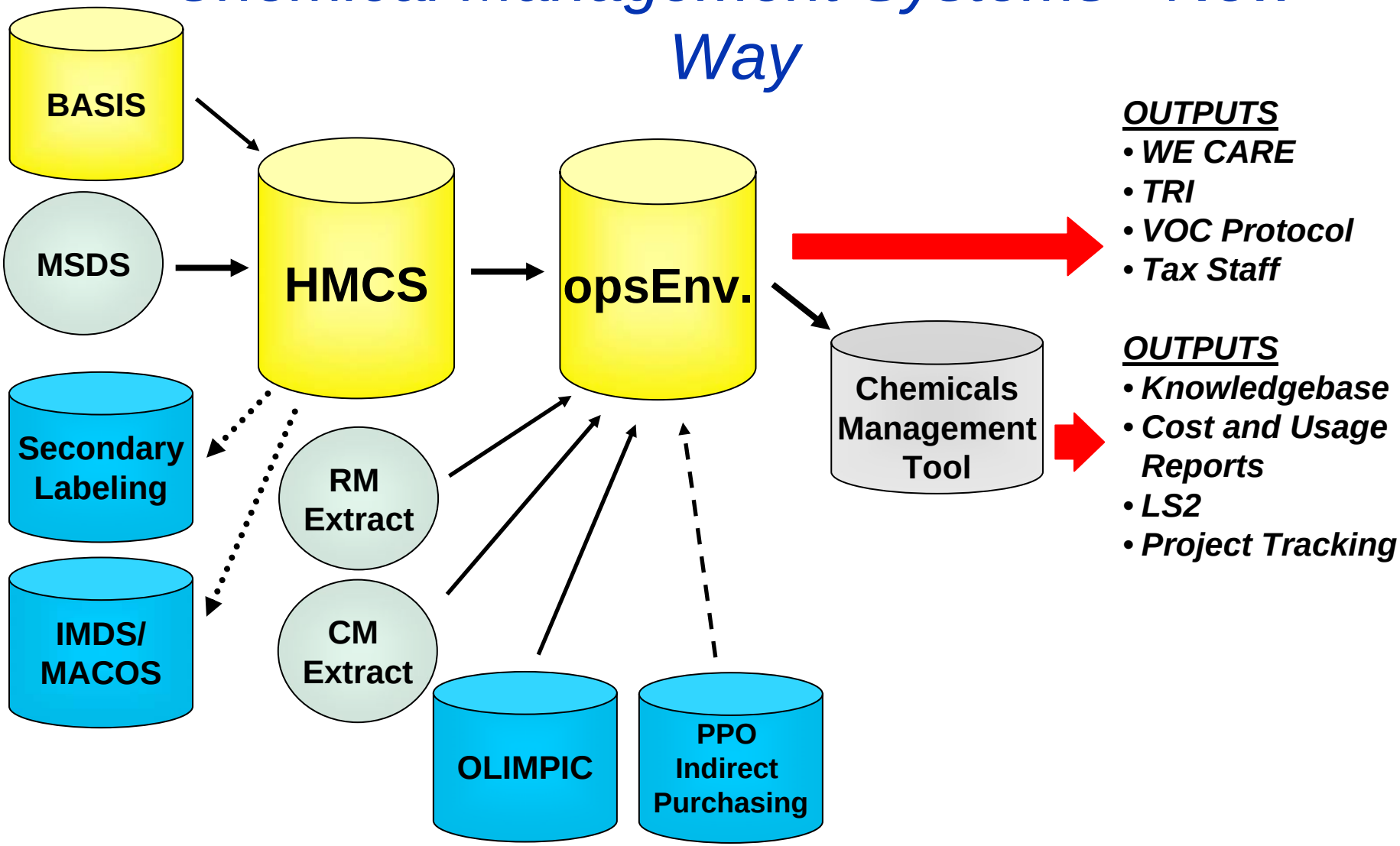
Reasons for development of a process for selecting, collecting, and establishing performance metrics in a large manufacturing company.

- *No common method for reporting*
- *Single point of data collection*
- *Aggregate data at plant, divisional, and corporate levels*
- *Apply contract pricing to chemical usage*
- *Standardize processes, materials and procedures*
- *Track Management, Staffing, and Equipment Fees*

Chemical Management Systems - Old Way



Chemical Management Systems - New Way



Chemicals Management Systems

System Tools and their Functions

Hazardous Material Control System (HMCS)

– *Inventory of Product/Chemical Material*

OpsEnvironmental

– *Regulatory reporting*

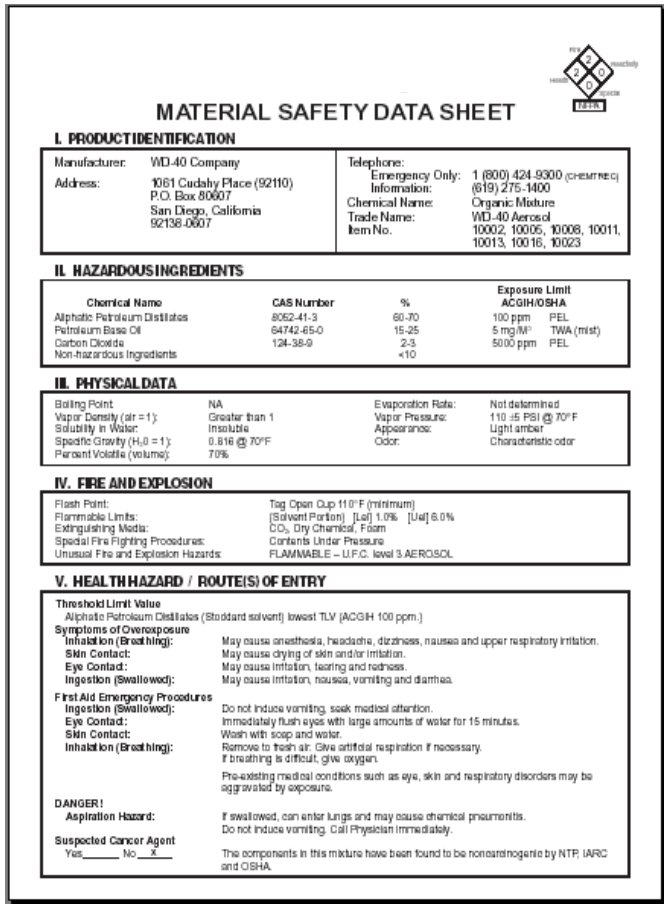
Chemicals Management Tool (CM Tool)

– *Business reporting*

– *Benchmarking*

– *Process usage analysis*

HMCS (Hazardous Material Control System)



MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
		Emergency Only:	1 (800) 424-9300 (CHEMTREC)
Address:	1061 Cudahy Place (92110)	Information:	(619) 275-1400
	P.O. Box 80607	Chemical Name:	Organic Mixture
	San Diego, California	Trade Name:	WD-40 Aerosol
	92138-0607	Item No.	10002, 10005, 10008, 10011, 10013, 10016, 10023

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA	
Aliphatic Petroleum Distillates	8052-41-3	60-70	100 ppm	PEL
Petroleum Base Oil	64742-65-0	15-25	5 mg/M³	TWA (mist)
Carbon Dioxide	124-38-9	2-3	5000 ppm	PEL
Non-hazardous Ingredients		<10		

III. PHYSICAL DATA

Boiling Point:	NA	Evaporation Rate:	Not determined
Vapor Density (air = 1):	Greater than 1	Vapor Pressure:	110 ±5 PSI @ 70°F
Solubility in Water:	Insoluble	Appearance:	Light amber
Specific Gravity (H_2O = 1):	0.816 @ 70°F	Odor:	Characteristic odor
Percent Volatile (volume):	70%		

IV. FIRE AND EXPLOSION

Flash Point:	Tag Open Cup 110°F (minimum)
Flammable Limits:	[Solvent Portion] [Lel] 1.0% [Uel] 6.0%
Extinguishing Media:	CO_2, Dry Chemical, Foam
Special Fire Fighting Procedures:	Contents Under Pressure
Unusual Fire and Explosion Hazards:	FLAMMABLE – U.F.C. level 3 AEROSOL

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value
Aliphatic Petroleum Distillates (Stoddard solvent) lowest TLV (ACGIH 100 ppm.)

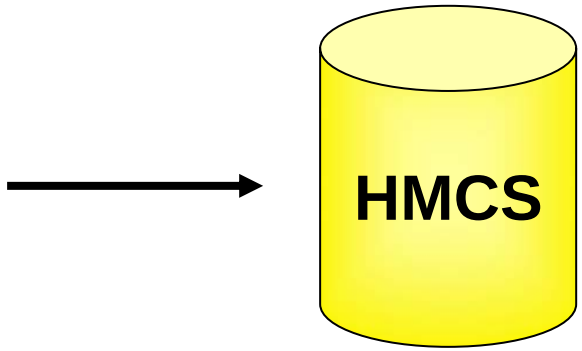
Symptoms of Overexposure
- **Inhalation (Breathing):** May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
- **Skin Contact:** May cause drying of skin and/or irritation.
- **Eye Contact:** May cause irritation, tearing and redness.
- **Ingestion (Swallowed):** May cause irritation, nausea, vomiting and diarrhea.

First Aid Emergency Procedures
- **Ingestion (Swallowed):** Do not induce vomiting, seek medical attention.
- **Eye Contact:** Immediately flush eyes with large amounts of water for 15 minutes.
- **Skin Contact:** Wash with soap and water.
- **Inhalation (Breathing):** Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.

Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure.

DANGER!
- **Aspiration Hazard:** If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call Physician immediately.

Suspected Cancer Agent
Yes_____ No__x__
The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA.



Information from MSDS is entered into HMCS and given a HMCS ID

HMCS (Hazardous Material Control System)

Corporate Tracking of Chemical Reduction

	#Active Materials in CHEMISTRI 01/09/2004 BASELINE Average	#Active Materials in CHEMISTRI 01/12/2005	#Active Materials in HMCS 04/07/2005	#Active Materials in HMCS 07/18/2005	#Active Materials in HMCS 10/2005	#Active Materials in HMCS 01/2006
Total Active Products GMR2 - US (except Saturn Spring Hill)	1051	68297	67498	65346		
Average number of Active Materials equals Total Active Materials divided by 65 Plants	1051	1038	1005	0	0	

Number of chemicals reduced from ~150,000 to ~66,000

Still too many…

opsEnvironmental - MML

MML
GMBA Number (Site Code)
Source
Begin Date
End Date
Part Number
Plant HMC#
Trade Name
Manufacturer
HMCS ID
Unit of Measure
Container Description
Conversion Factor
Conversion Unit
Material Type
Minority Supplier
EPA Storage Container Type Code
EPA Pressure Code
EPA Storage Temperature Code

The MML (Master Material List) is a listing of products used in the plant.

- *Each product is given a unique Part Number by container*
- *Each product is tagged to a HMCS ID*
- *Conversion Factor is used to convert to pounds or gallons*

Example:

Two identical products purchased in different containers have the same HMCS ID and similar but unique Part Numbers with container specific Conversion Factors

XXX001-D is purchased in Drums
Conversion Factor = 55 GALS

XXX001-P is purchased in Pails
Conversion Factor = 5 GALS

opsEnvironmental -Transactions

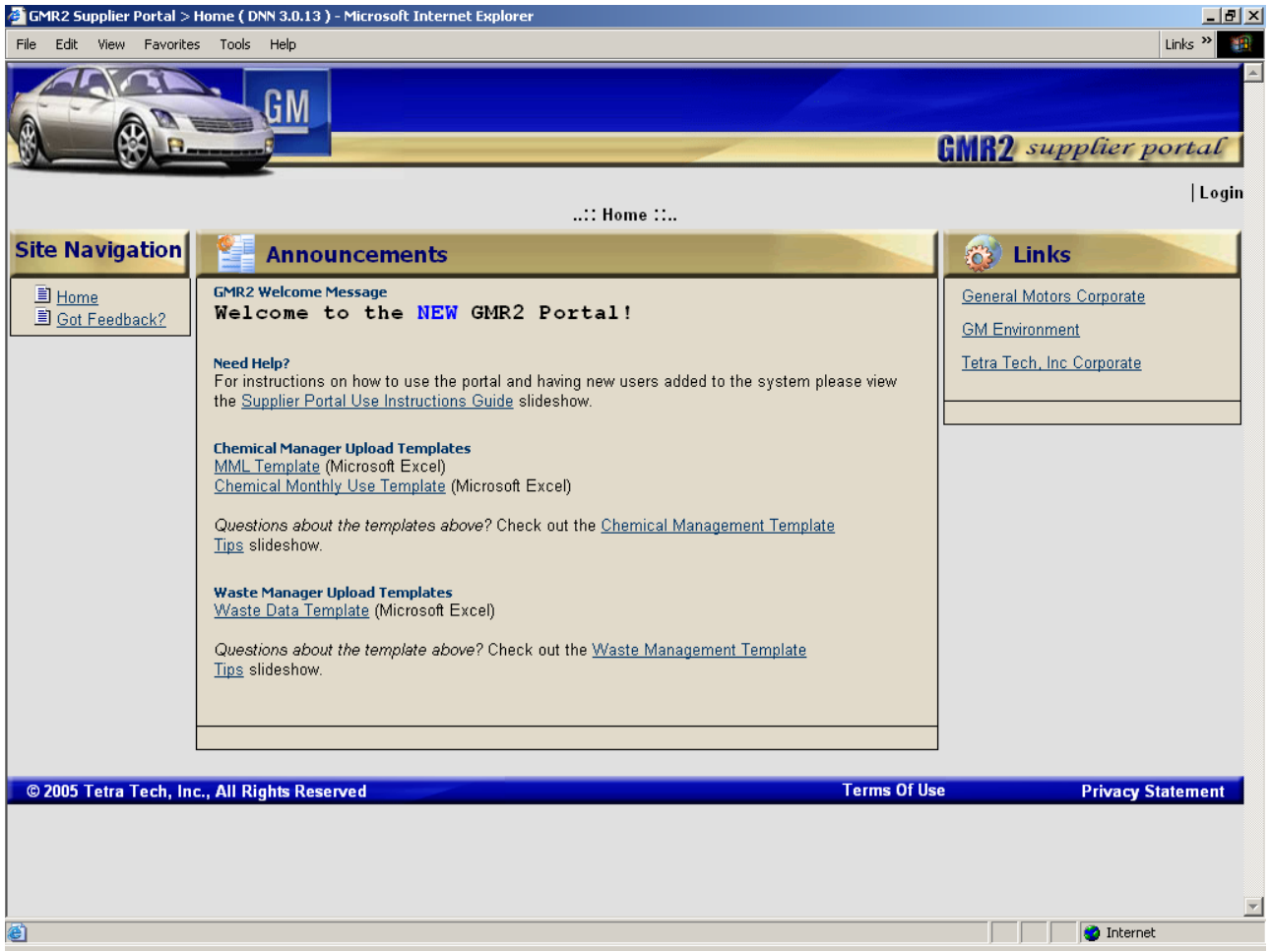
TRANSACTIONS
GMBA Number (Site Code)
Source
Transaction Type
Transaction Date
Part Number
HMCS ID
Trade Name
Manufacturer
Unit of Measure
Container Description
Transaction Amount/Quantity
Storage Location
Usage Location
Cost Center Classification
Cost Center
Process
Chemical Category

The Transactional file is a monthly submission of products consumed at the plant.

- *Relates to MML by Part Number*
- *Cost Center, Process, and Chemical Category fields are used to categorize indirect chemicals in the Chemicals Management program*

~200,000 Transactions/Year
~10,000 Chemicals Mgmt Trans/Month

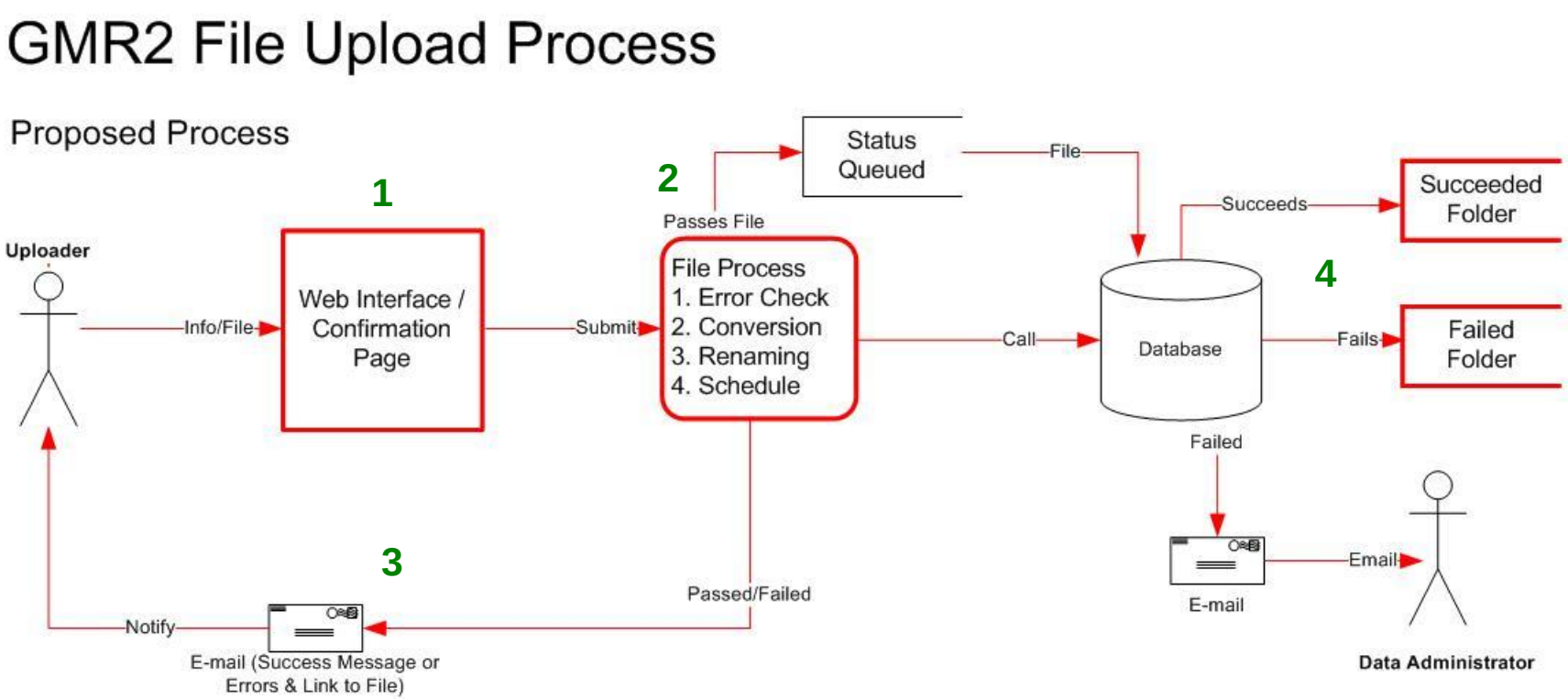
Supplier Portal



Supplier Portal - File Submission Process

- *The MML and Transaction files are submitted by the Chemicals Manager through the Supplier Portal.*
- *Each file is checked for proper format and completeness and is then validated.*
- *The Chemicals Manager receives instant notification for blank required fields, unmatched fields, etc.*
- *If the file passes validation it is loaded into the database.*

Supplier Portal - File Submission Process



1. ***Supplier submits file through web portal.***
2. ***If file passes validation, it is queued for loading into database.***
3. ***Supplier receives e-mail whether file was accepted or not.***
   If not, the e-mail contains error listing and returns the file.
4. ***Upon successful loading, file is sent to 'Succeeded Folder', otherwise file is sent to 'Failed Folder'.***
   If loading fails, database administrator is notified.

Process Control Information

Service Report

TOTAL

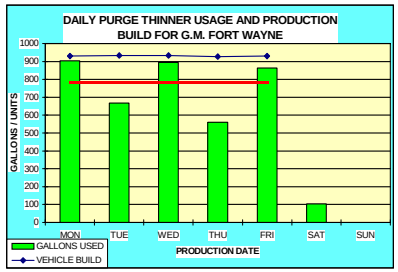
DAILY PURGE USAGE:

DAY	GALLONS USED	VEHICLE BUILD
	905	930
	667	934
	895	933
	561	928
	864	930
	104	
SUN	0	

TOTAL PURGE USED : 3,995 GAL

AVERAGE DAILY PURGE SOLVENT USE: 799 GAL

GALLONS PER UNIT SOLVENT USE: 0.86

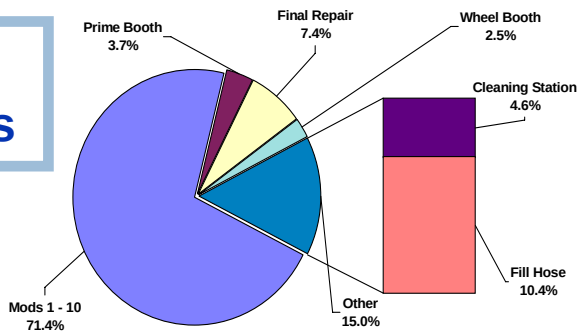


WEEKLY INVENTORY:

PRODUCT	BEGINNING BALANCE	AMOUNT SHIP	ENDING BALANCE	WEEK USAGE	M.T.D USAGE	POUNDS V.O.C.'s M.T.D.	Y.T.D. USAGE	POUNDS V.O.C.'s Y.T.D.
5799 PURGE	7,228	5,965	8,877	4,316	12,324	85,908	44,264	308,562
P.M.A.	3,087	0	3,087	0	0	0	0	0
B - CELL	2,055	0	2,055	0	0	0	0	0
I.P.A.	55	0	55	0	0	0	275	1,791
M.E.K.	0	0	0	0	0	0	0	0
1631	0	0	0	0	0	0	0	0

USAGE BY AREA:

% by Process

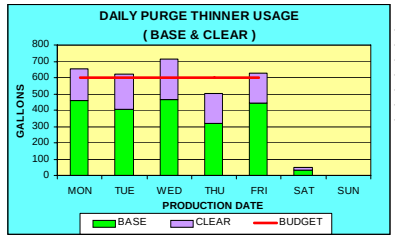


DAILY PURGE USAGE MODS 1 - 10:

DAY	BASE	CLEAR
MON	462	191
TUE	405	216
WED	463	248
THU	318	186
FRI	444	184
SAT	33	16
SUN	0	0

TOTAL PURGE USED : 2,125 GAL

AVERAGE DAILY PURGE SOLVENT USE 425 GAL



TOPCOAT

DAILY PURGE USAGE PAINT MIX:

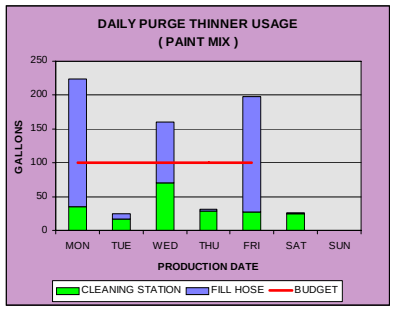
DAY	CLEANING STATION	FILL HOSE
MON	35	189
TUE	17	8
WED	70	90
THU	28	2
FRI	27	170
SAT	25	2
SUN	0	0

TOTAL PURGE USED: CLN STATION 202 GAL

AVERAGE DAILY PURGE CLN STATION 40 GAL

TOTAL PURGE USED: FILL HOSE 462 GAL

AVERAGE DAILY PURGE FILL HOSE 92 GAL



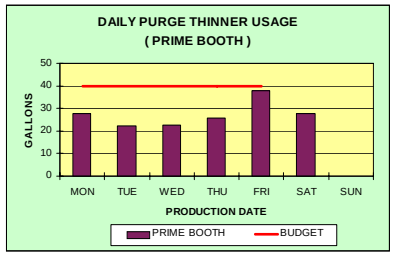
PAINT MIX

DAILY PURGE USAGE PRIME BOOTH:

DAY	PRIME BOOTH
MON	28
TUE	22
WED	23
THU	26
FRI	38
SAT	28
SUN	0

TOTAL PURGE USED : 164 GAL

AVERAGE DAILY PURGE PRIME BOOTH 33 GAL



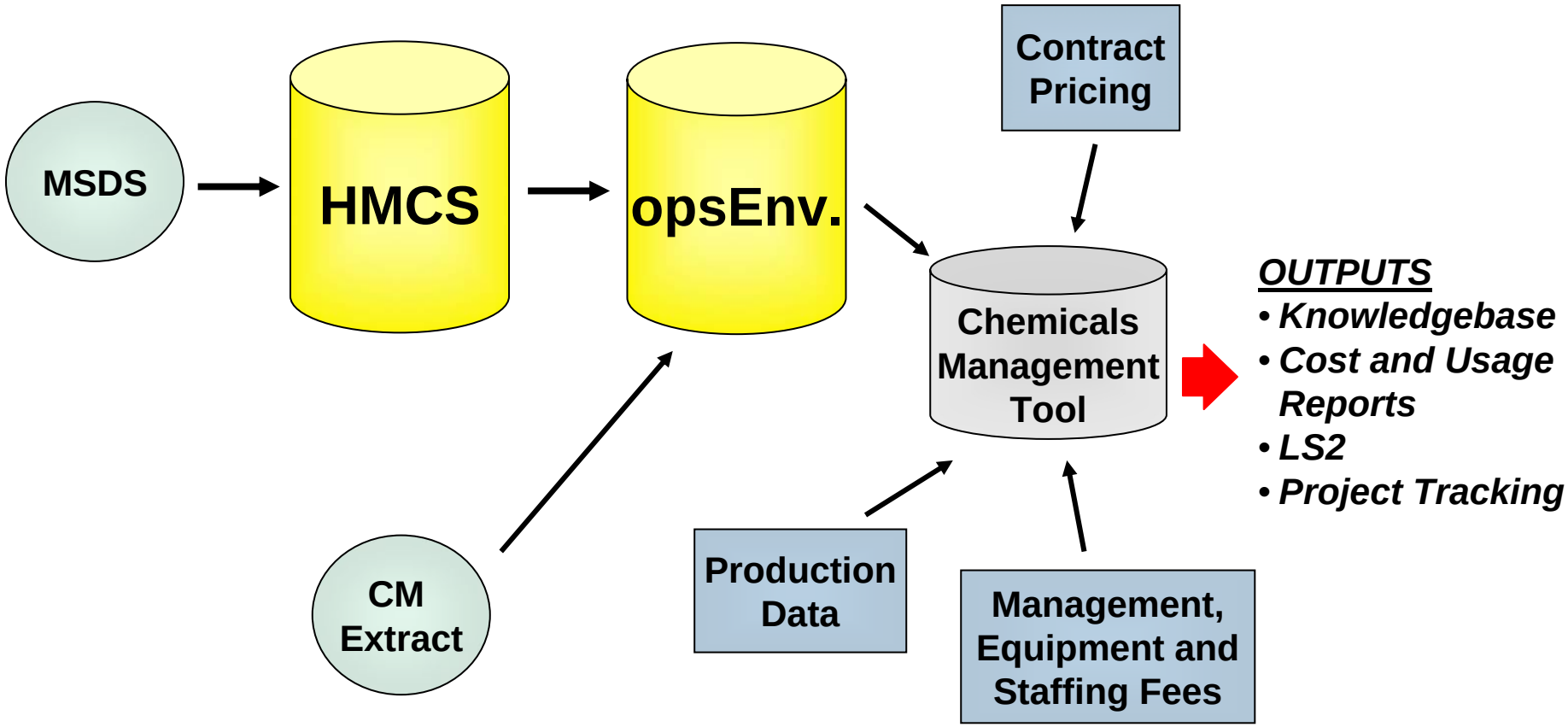
PRIMER SURFACER

Metrics

- ***Supplier Requirements***
  - *On-time submission*
  - *Percent transactions passing validation*
  - *Usage totals*

- ***Regulatory Reporting***
  - *Toxic Reduction Inventory (TRI) reports*
  - *HAZWOPER program*

Chemicals Management Tool; Flow Diagram



Chemicals Management Tool

opsEnvironmental is a third party environmental reporting system

Chemicals Management Tool interfaces with data tables in opsEnvironmental

Only supplier specific data from opsEnvironmental is available in Chemicals Management database

Supplier personnel and Chemical Managers can access Chemicals Management Tool via Citrix Server

Chemicals Management Tool

Additional reporting capabilities of Chemicals Management Tool not available in opsEnvironmental

- *Query and group chemicals based on categories in Transaction file*
- *Apply contract pricing and fees to usage*
- *Costs per square foot*
- *Costs per unit of production*
- *Product specific comparisons*

Suppliers now have the ability to see data after it is submitted and correct errors

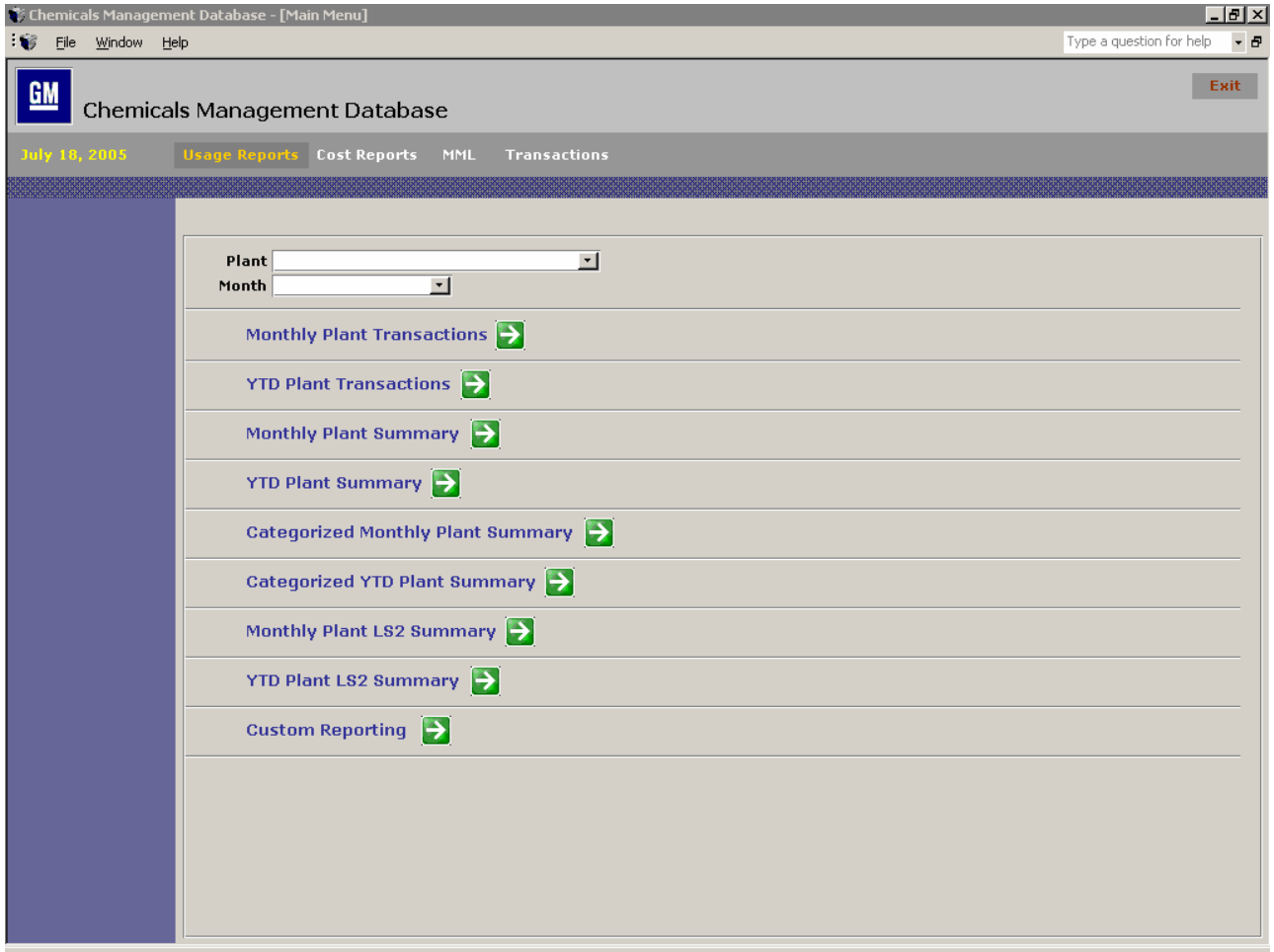
Chemicals Management Tool

Usage Reports

Plant Transactions
Individual Transactions

Plant Summary
Summarized by Part Number

Categorized Plant Summary
Summarized by Part Number and Chemicals Management Categories

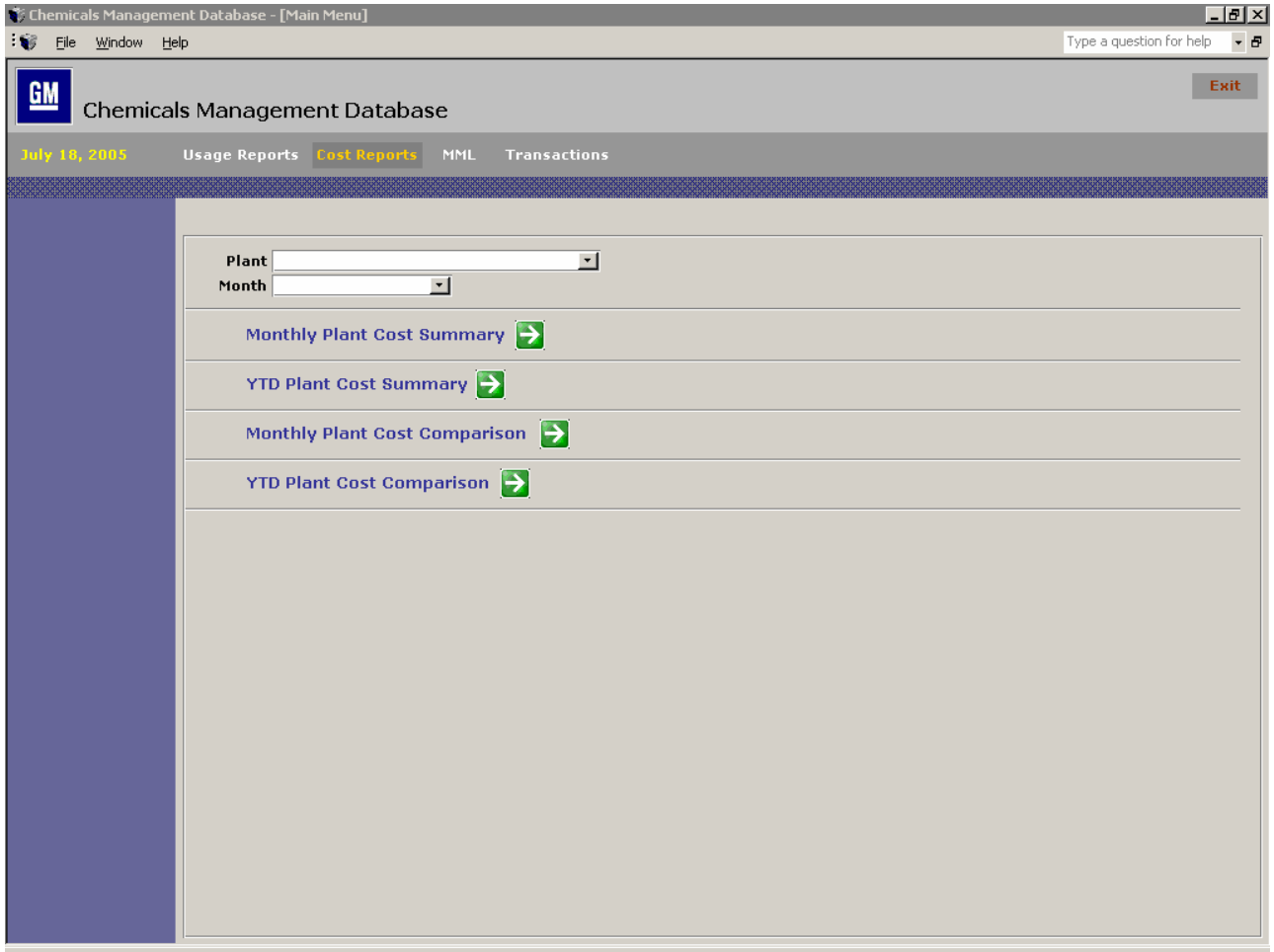


Chemicals Management Tool

Cost Reports

Plant Cost Summary
Summarized by Part Number

Plant Cost Comparison
Compares cost to same time period of previous year

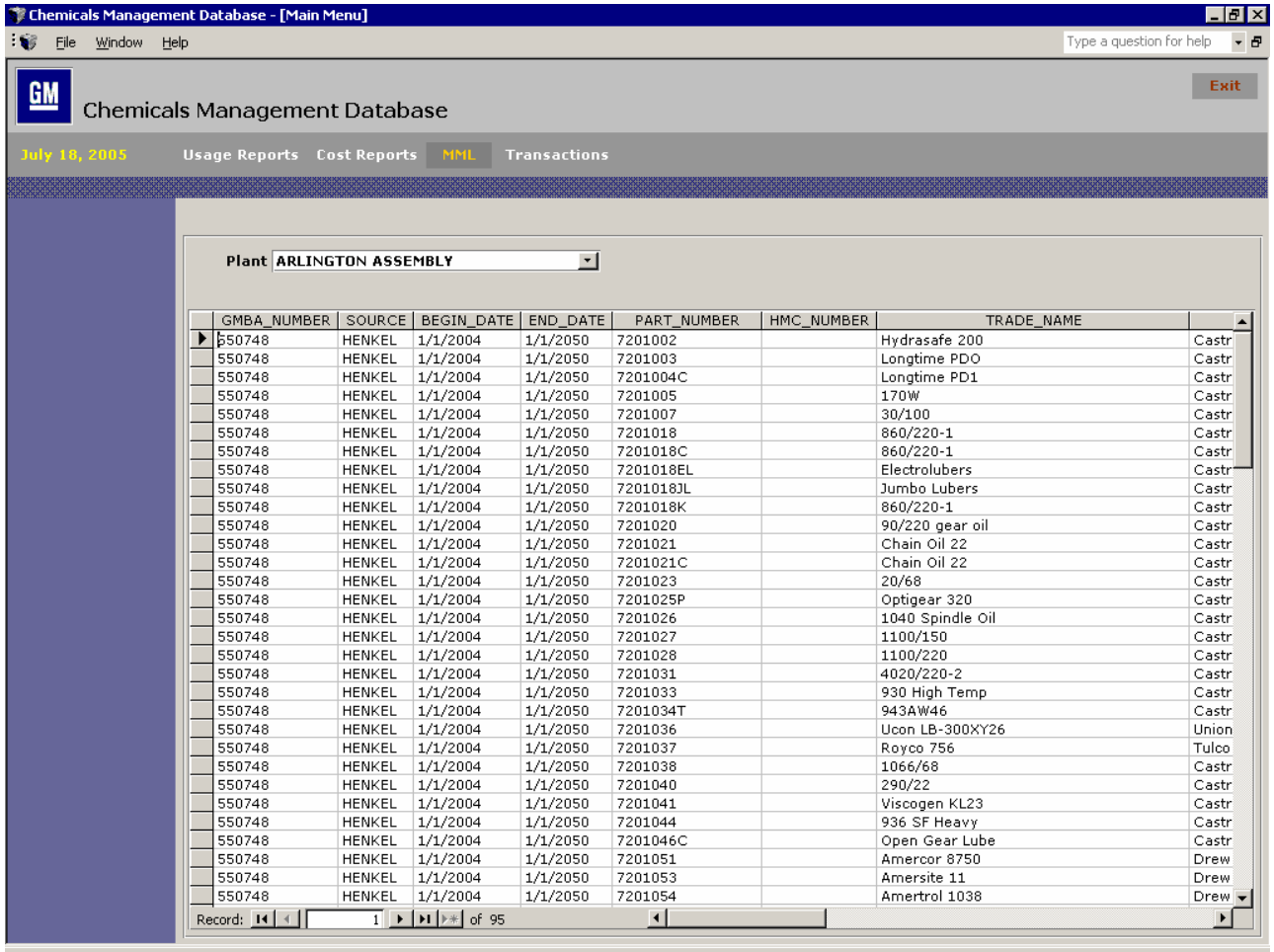


Chemicals Management Tool

MML Data

Displays current MML file loaded in database

Data is sortable, filterable and exportable



GMBA_NUMBER	SOURCE	BEGIN_DATE	END_DATE	PART_NUMBER	HMC_NUMBER	TRADE_NAME	
550748	HENKEL	1/1/2004	1/1/2050	7201002		Hydrasafe 200	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201003		Longtime PDO	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201004C		Longtime PD1	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201005		170W	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201007		30/100	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201018		860/220-1	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201018C		860/220-1	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201018EL		Electrolubers	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201018JL		Jumbo Lubers	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201018K		860/220-1	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201020		90/220 gear oil	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201021		Chain Oil 22	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201021C		Chain Oil 22	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201023		20/68	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201025P		Optigear 320	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201026		1040 Spindle Oil	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201027		1100/150	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201028		1100/220	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201031		4020/220-2	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201033		930 High Temp	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201034T		943AW46	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201036		Ucon LB-300XY26	Union
550748	HENKEL	1/1/2004	1/1/2050	7201037		Royco 756	Tulco
550748	HENKEL	1/1/2004	1/1/2050	7201038		1066/68	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201040		290/22	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201041		Viscogen KL23	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201044		936 SF Heavy	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201046C		Open Gear Lube	Castr
550748	HENKEL	1/1/2004	1/1/2050	7201051		Amercor 8750	Drew
550748	HENKEL	1/1/2004	1/1/2050	7201053		Amersite 11	Drew
550748	HENKEL	1/1/2004	1/1/2050	7201054		Amertrol 1038	Drew

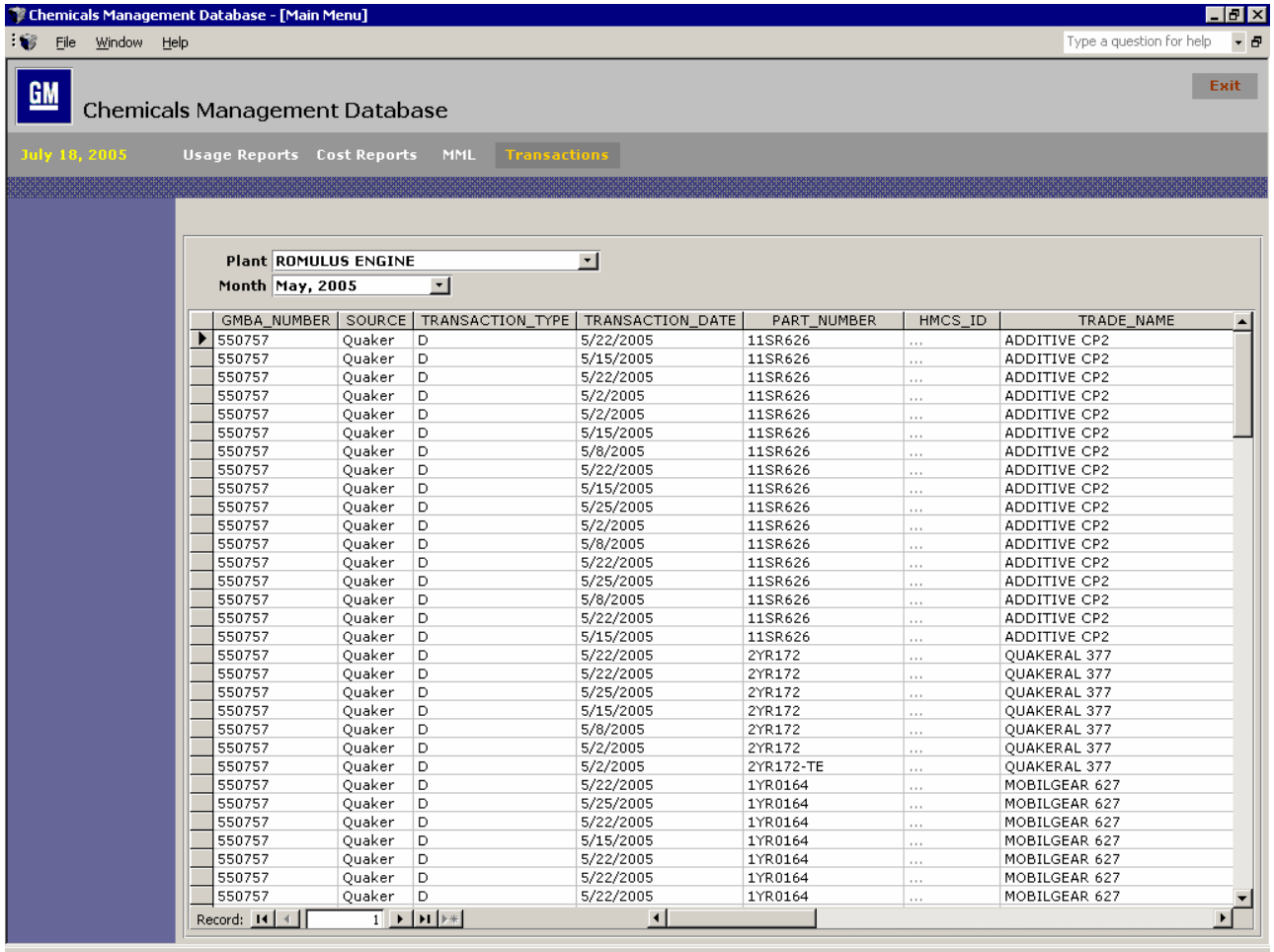
Record: 1 of 95

Chemicals Management Tool

Transactional Data

Displays current Transactional files loaded in database

Data is sortable, filterable and exportable



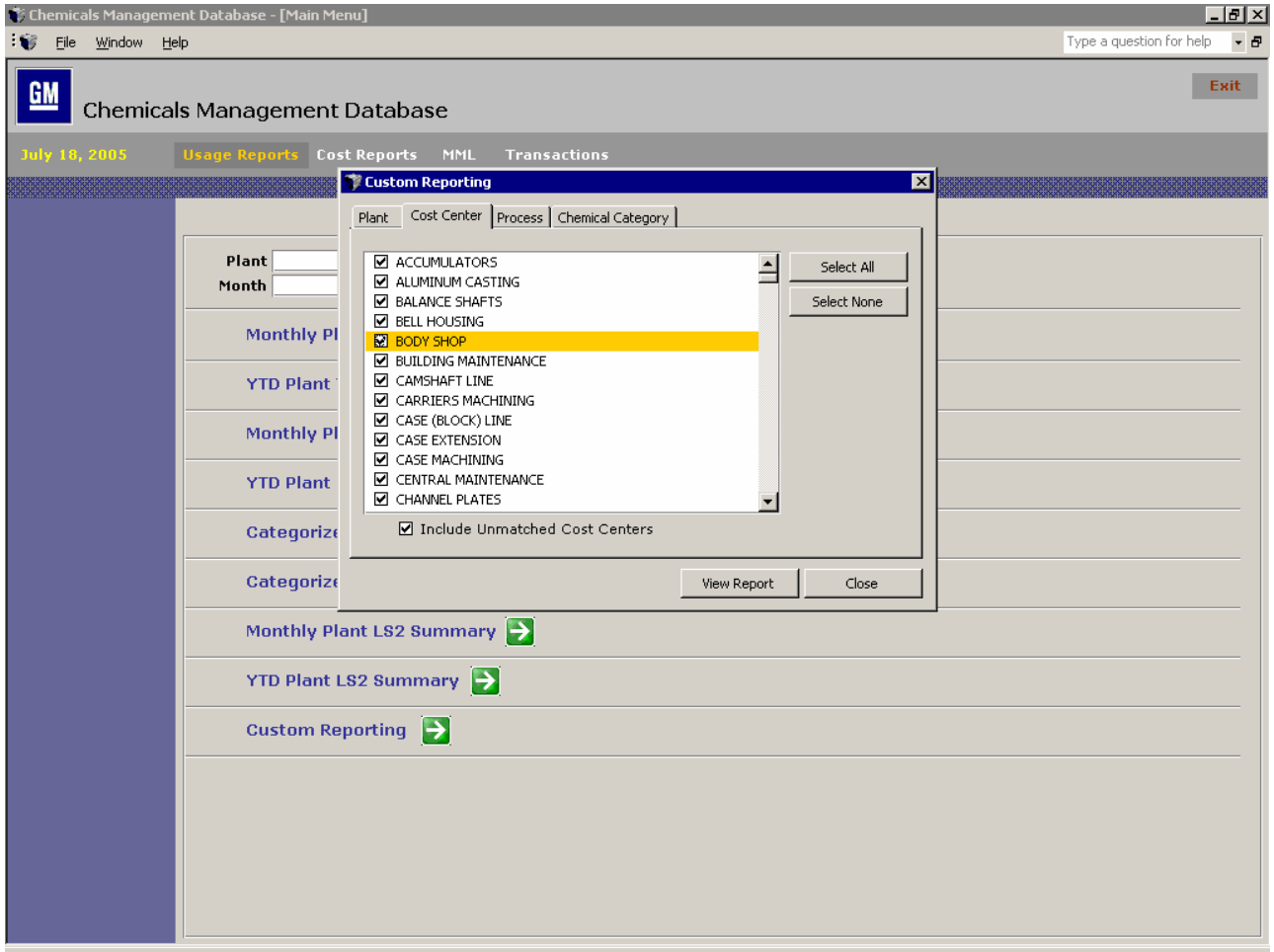
Chemicals Management Tool

Custom Reporting

Similar to the Categorized Plant Summary

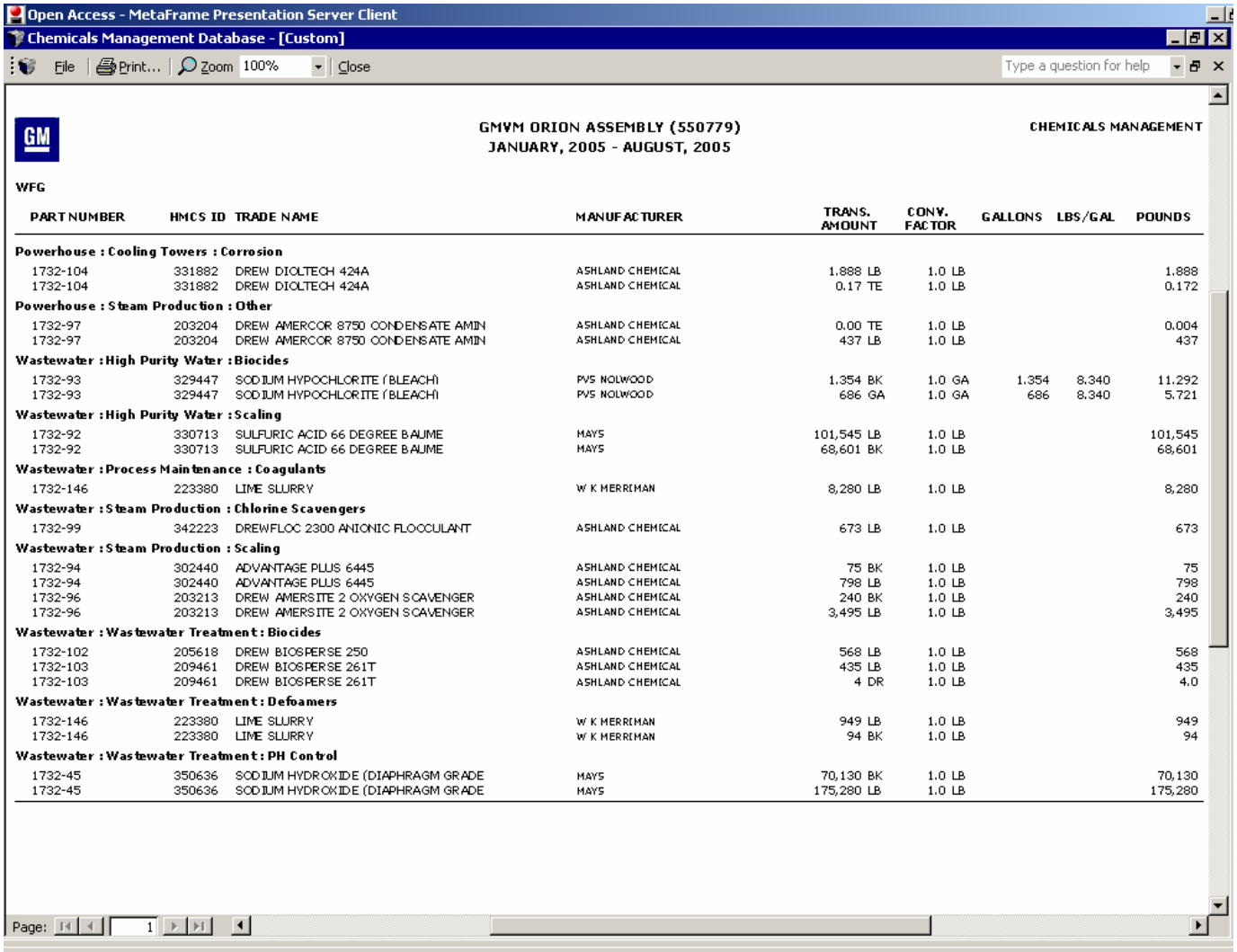
Additional capability of customizing report

Allows selection of specific Cost Centers, Processes, and Chemical Categories as report parameters



Chemicals Management Tool

Utilities



GM

GMVM ORION ASSEMBLY (550779)
JANUARY, 2005 - AUGUST, 2005

CHEMICALS MANAGEMENT

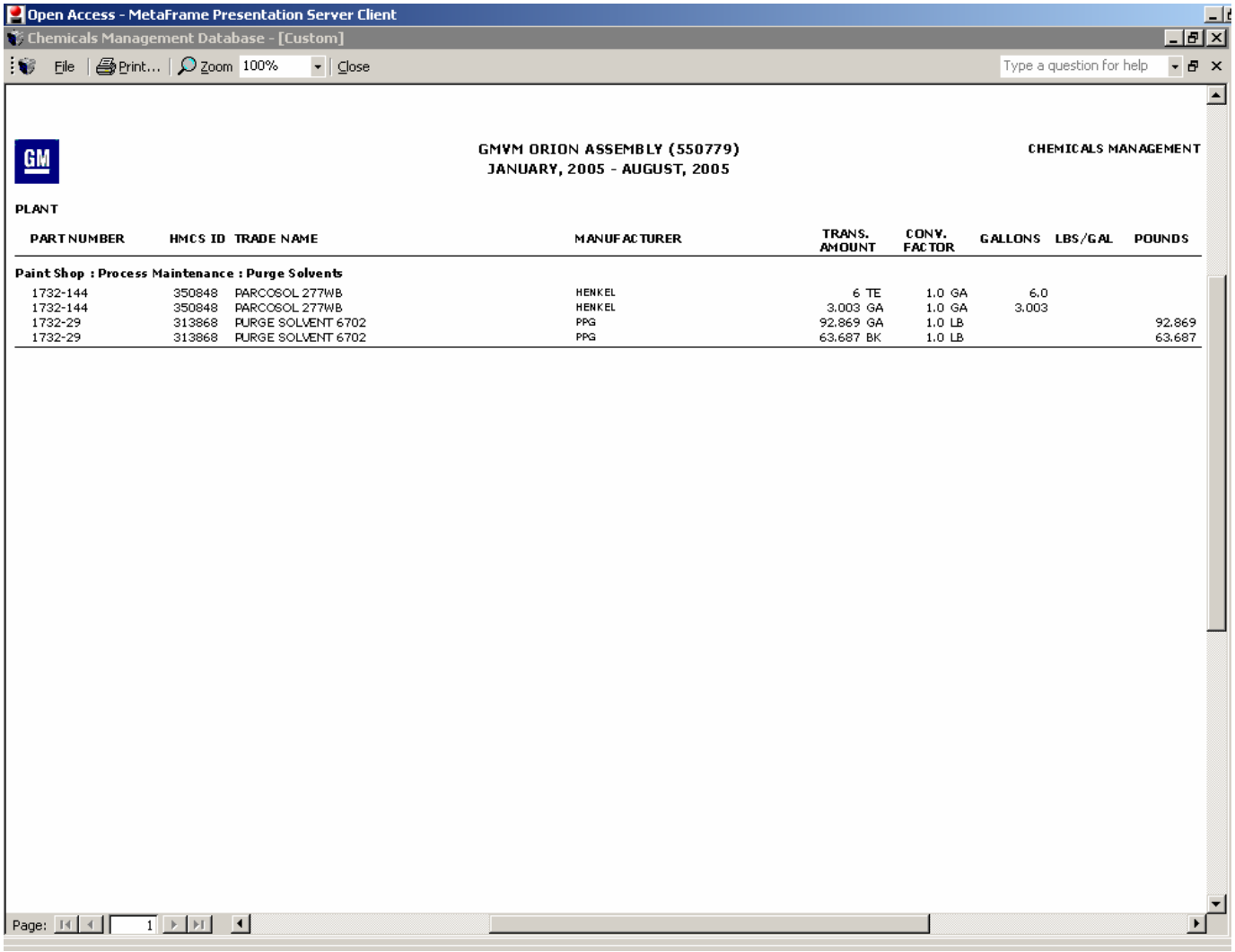
WFG

PART NUMBER	HMCS ID	TRADE NAME	MANUFACTURER	TRANS. AMOUNT	CONV. FACTOR	GALLONS	LBS/GAL	POUNDS
Powerhouse : Cooling Towers : Corrosion								
1732-104	331882	DREW DIOLTECH 424A	ASHLAND CHEMICAL	1,888 LB	1.0 LB			1,888
1732-104	331882	DREW DIOLTECH 424A	ASHLAND CHEMICAL	0.17 TE	1.0 LB			0.172
Powerhouse : Steam Production : Other								
1732-97	203204	DREW AMERCOR 8750 CONDENSATE AMIN	ASHLAND CHEMICAL	0.00 TE	1.0 LB			0.004
1732-97	203204	DREW AMERCOR 8750 CONDENSATE AMIN	ASHLAND CHEMICAL	437 LB	1.0 LB			437
Wastewater : High Purity Water : Biocides								
1732-93	329447	SODIUM HYPOCHLORITE (BLEACH)	PVS NOLWOOD	1,354 BK	1.0 GA	1,354	8.340	11,292
1732-93	329447	SODIUM HYPOCHLORITE (BLEACH)	PVS NOLWOOD	686 GA	1.0 GA	686	8.340	5,721
Wastewater : High Purity Water : Scaling								
1732-92	330713	SULFURIC ACID 66 DEGREE BAUME	MAYS	101,545 LB	1.0 LB			101,545
1732-92	330713	SULFURIC ACID 66 DEGREE BAUME	MAYS	68,601 BK	1.0 LB			68,601
Wastewater : Process Maintenance : Coagulants								
1732-146	223380	LIME SLURRY	W K MERRIMAN	8,280 LB	1.0 LB			8,280
Wastewater : Steam Production : Chlorine Scavengers								
1732-99	342223	DREWFLOC 2300 ANIONIC FLOCCULANT	ASHLAND CHEMICAL	673 LB	1.0 LB			673
Wastewater : Steam Production : Scaling								
1732-94	302440	ADVANTAGE PLUS 6445	ASHLAND CHEMICAL	75 BK	1.0 LB			75
1732-94	302440	ADVANTAGE PLUS 6445	ASHLAND CHEMICAL	798 LB	1.0 LB			798
1732-96	203213	DREW AMERSITE 2 OXYGEN SCAVENGER	ASHLAND CHEMICAL	240 BK	1.0 LB			240
1732-96	203213	DREW AMERSITE 2 OXYGEN SCAVENGER	ASHLAND CHEMICAL	3,495 LB	1.0 LB			3,495
Wastewater : Wastewater Treatment : Biocides								
1732-102	205618	DREW BIOSPERSE 250	ASHLAND CHEMICAL	568 LB	1.0 LB			568
1732-103	209461	DREW BIOSPERSE 261T	ASHLAND CHEMICAL	435 LB	1.0 LB			435
1732-103	209461	DREW BIOSPERSE 261T	ASHLAND CHEMICAL	4 DR	1.0 LB			4.0
Wastewater : Wastewater Treatment : Defoamers								
1732-146	223380	LIME SLURRY	W K MERRIMAN	949 LB	1.0 LB			949
1732-146	223380	LIME SLURRY	W K MERRIMAN	94 BK	1.0 LB			94
Wastewater : Wastewater Treatment : PH Control								
1732-45	350636	SODIUM HYDROXIDE (DIAPHRAGM GRADE	MAYS	70,130 BK	1.0 LB			70,130
1732-45	350636	SODIUM HYDROXIDE (DIAPHRAGM GRADE	MAYS	175,280 LB	1.0 LB			175,280

Page: 1

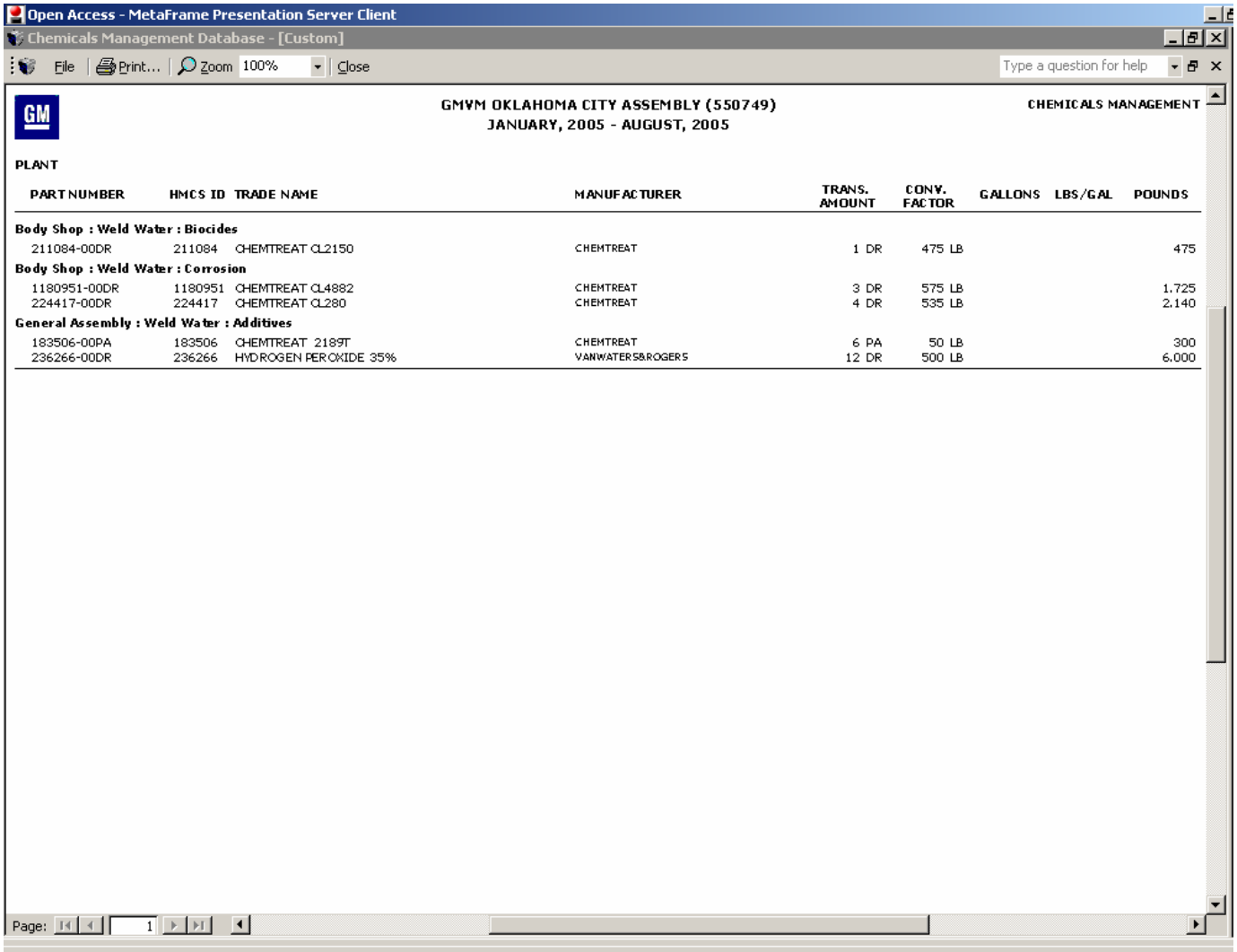
Chemicals Management Tool

Purge Solvents



Chemicals Management Tool

Weld Water



PART NUMBER	HMCS ID	TRADE NAME	MANUFACTURER	TRANS. AMOUNT	CONV. FACTOR	GALLONS	LBS/GAL	POUNDS
Body Shop : Weld Water : Biocides								
211084-00DR	211084	CHEMTREAT CL2150	CHEMTREAT	1 DR	475 LB			475
Body Shop : Weld Water : Corrosion								
1180951-00DR	1180951	CHEMTREAT CL4882	CHEMTREAT	3 DR	575 LB			1,725
224417-00DR	224417	CHEMTREAT CL280	CHEMTREAT	4 DR	535 LB			2,140
General Assembly : Weld Water : Additives								
183506-00PA	183506	CHEMTREAT 2189T	CHEMTREAT	6 PA	50 LB			300
236266-00DR	236266	HYDROGEN PEROXIDE 35%	VANWATERS&ROGERS	12 DR	500 LB			6,000

Chemicals Management Tool

Performance metrics can include

- *Cost per part produced*
- *Cost per ton of steel processed*
- *Cost per ton of metal melted*
- *Number of chemicals used*
- *Number of chemicals used by process*
- *Volume of chemicals used*
- *Inventory turns*
- *Value of process savings initiative*
- *Performance against contract cost savings goals*

SPQRCE Scorecard

CHEMICAL MANAGEMENT - SCORECARD
GM FAIRFAX
Date: 6/2005

Meets or Exceeds Expectation
Slightly Behind Goal
Behind Goal

KEY MEASUREMENT/GOALS	2005 Target	April Activity	May Activity	June Activity	Year-to-Date Activity	Comments	Scale
SAFETY							
Remain Active in HMCC	100%						Yes, No
Recordable vendor safety incidents	0 incidents						0, 1, 2
Provide products in DOT / GM approved containers	100%						100%, 70%-99%, </= 69%
Maintain Bio-control manual	Update Quarterly						On Schedule, Behind Sch.
Conform to all Health and Safety requirements	100%						Yes, No
PEOPLE							
Normalize contract to reflect actual usage	May-05						Complete, Not done
Attend required meetings	As Required						Yes, No
Provide on-site personnel per CM RFQ	Monthly						4, 3, <3
Complete CM duties outlined by GM Fairfax CMC	Monthly						Yes, No
Provide the required equipment per the CM RFQ	Monthly						Yes, No
QUALITY							
Complete required testing of CM systems (detack, CT, lube, etc)	As Required						In spec: within 5%, >5%
Define and Implement a continuous process improvement (CPI) process	Monthly						On Schedule, Behind Sch.
Define and Implement a joint problem resolution (JPR) process	As Required						On Schedule, Behind Sch.
RESPONSIVENESS							
On time deliveries	100%					BCTL 2100 Backordered in March	100%, 70%-99%, </=69%
* Submit GMR2/Facts data by 10th day @ month	100%						Yes, No
Complete reporting per the GM CM RFQ	100%						Yes, No
Complete monthly reviews with the plant CM committee	Monthly						On Schedule, Behind Sch.
Prompt empty container return to supplier(s)	W/I of 1 week						</= 5 days, 6-9 days, >/=10

SPQRCE Scorecard (cont'd)

CHEMICAL MANAGEMENT - SCORECARD
GM FAIRFAX
Date: 6/2005

Meets or Exceeds Expectation
Slightly Behind Goal
Behind Goal

KEY MEASUREMENT/GOALS	2005 Target	April Activity	May Activity	June Activity	Year-to-Date Activity	Comments	Scale
COST & CONSUMPTION							
Reduce material consumption	5%/yr					20% reduction over Feb 2004	</=5%, 3-5%, </=3%
Performance to budget - fixed costs	Monthly						< Budget, +1-5%, +5%
Submit CM invoice to Financial by the 20th of each month	Monthly					Invoice was late due to pending allocation discussions	Yes, No
Conformance to the WWP report card	12/31/2005						100%, <100%
Return unused unopened products to supplier(s)	W/I 2 week						</=10 days, 12-19 days, >/=20
Adherence to the 10% minority content	12/31/2005					March 15.14%	>/=10%, 6-9%, </= 5%
TECHNOLOGY							
Test low VOC products	12/31/2005						On Schedule, Behind Sch.
Test Recycled Purge Thinner	5/31/2005						
Make recemmendations on oil filtration	Mar-04						On Schedule, Behind Sch.
ENVIRONMENT							
Adherence to the MSDS management requirements	Monthly						Yes, No
Complete required manifesting	100%						Yes, No
Attend appropriate Environmental meetings	As Required						Yes, No
Reduce active chemical list	10%					Removing inactive chemicals from HMCS will give a 16% reduction	>/=10%, 9-3%, </=3%
Perform Monthly Audit on RTUs, Parts Washers and Solvent Recovery Stations	Monthly						Complete,Not Done
Assist in environmental reporting	Monthly						Yes, No

** Corporate Goals and Objectives*