

# **ABC Chemical Company SRDS**

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**AMERICAN BARCODE  
AND RFID**

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## **Project Description**

This branch of the ABC Chemical Company is responsible for tracking the usage of chemicals and waste both hazardous and treatable waste water. There are current checks and balances in place to track this currently but the purpose of this project is to put in place a system which will marry a container to a "Barcode ID". This barcode can be scanned at various steps along the process so that "absolute knowledge" of the history of each container is attained. This process will track a container "Cradle to Grave" regardless if the container is used to house unused or "Virgin Materials" materials or one of the two types of waste.

## **Project Purpose**

ABC Chemical Company and its partner ChemThink Distributors are installing this Barcode Tracking System in order to satisfy the following basic requirements:

- Tracking of chemicals based on a Container ID Number".
- Using a portable handheld data collector with integrated scanner, an operator can scan the barcode on the container and the system will display:
  - The contents of the contents of the container (profile, product or empty).
  - The last known location of the container.
- On the PC the user will be able to extract reports describing:
  - The contents and location of any given container selectable by "Container ID".
  - The Locations and Container ID numbers of chemicals selectable by "Profile" or "Product".
  - The "90 day "status of the container if it is waste.
  - System usage by "Department".
  - Waste by weight – This report will list all of the profile numbers and display a "total weight" for each. If the same chemical has more than one profile number, the weight will be included in both.
- Automatic email generation – At a set time each day an email is generated which lists hazardous wastes which are at 55 days or higher. There will be a list of people who will receive this daily email.

## **Current ABC Chemical Company Practices**

There are two distinct processes currently going on at the ABC Chemical Company facility.

1. Tracking of unused or "Virgin" chemicals
2. Tracking of waste

We will use the same system for all practices. From the point of view of the system, we are tracking containers and their contents so there should be no problem using the same system for all requirements.

## **Recommended Solution Description - Hazardous Waste**

The current process involves 3 work orders, one for moving the empty container to the department or facility in which it will be used and the other for moving the now full container back to ChemThink Distributors and a third to ship it out of ChemThink Distributors.

### ***Empty Container Pickup***

A work order is generated at ABC Chemical Company and transmitted to ChemThink Distributors. At the ChemThink Distributors yard our new process will begin. Before any tracking can occur a barcode needs to be placed on the container. The barcode will be generated in the ChemThink Distributors trailer from a PC workstation which will be connected to the network with access to ABC Chemical Company's SQL Server. The user will enter:

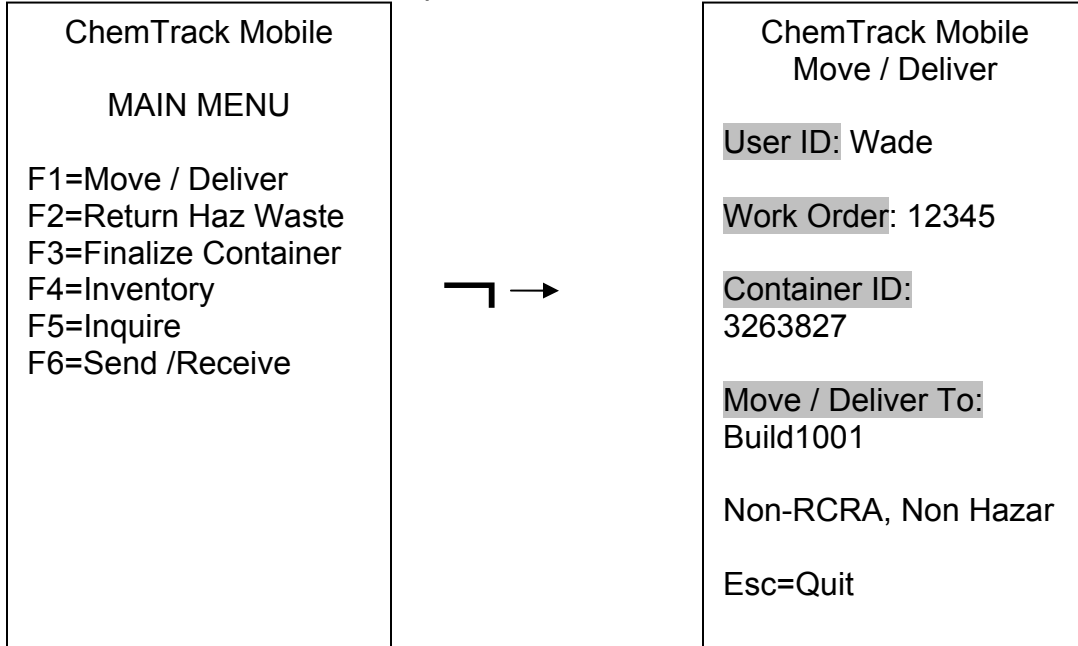
- Delivery User (Selectable from a list)
- Work Order Number (Typed)
- Profile Number (Selectable from a list) Up to 4 profile numbers can be entered for a container. We will require at least one profile number with each container.
- Department
- Delivery Location (Selectable from a list)

A "Container ID" will be automatically generated. This will be a unique number that will be automatically generated and will not repeat in the system. After the data is entered and "committed" to the system a 4 x 6 barcode will be generated. A [sample](#) of this barcode can be found later in this document as well as a [sample](#) of the entry form

The barcode will be placed on the container and delivered to the proper location. The container will be assigned to a location called "In Transit".

## **Empty Container Delivery**

The delivery person will drop off the container at the correct building. At the time of delivery the container will be scanned with a portable data collector. The interface will look like the examples below:



The user will select the "UserID" from a list. The "Work Order" number will be entered on the keyboard. The "Container ID" will be scanned from the container and the "Deliver To:" will be selected from a list. (Optional: - We could have barcodes in a notebook for the "Deliver To". Large lists are not easy to navigate.)

The transaction will be saved and time and date stamped.

### **Remove Filled Hazardous Waist Container**

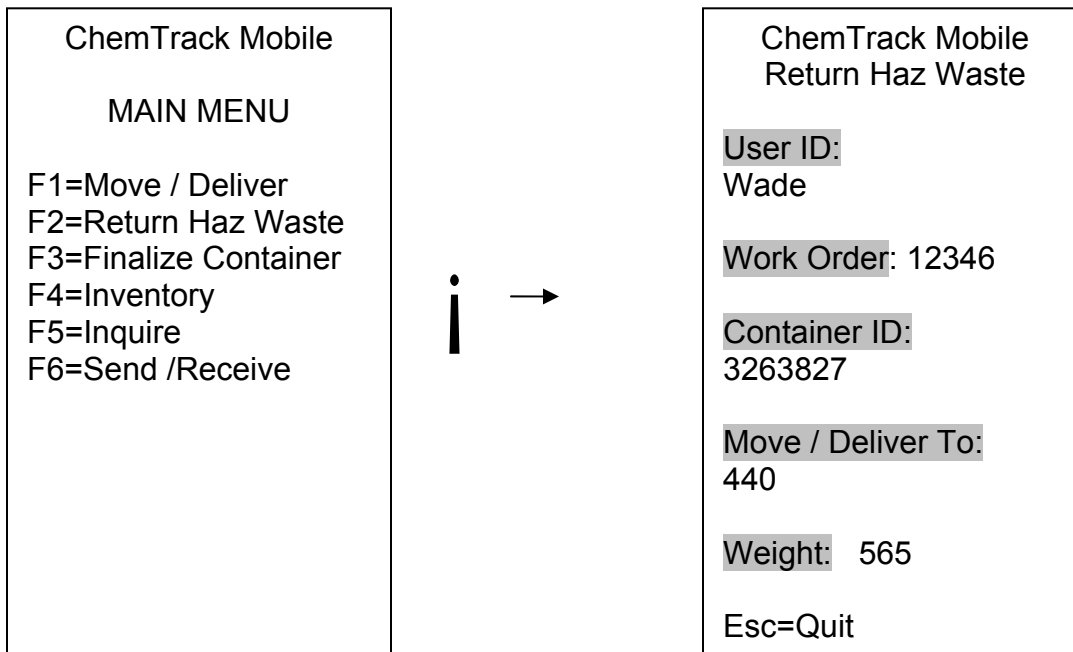
The user will use the "Move Container" function on the handheld. The behavior will be the same as above but the user will select "In Transit" as the "Move / Deliver To" location.

### **Return Hazardous Waste to 90 Day Yard**

The User will use the "Return Haz Waste" function on the handheld. This is essentially the same process as the "Move / Deliver" with the following differences:

1. The unit will prompt the user for the weight. This data is collected only on Hazardous Waste containers when they are brought to the 90 day storage yard.

- The “Deliver To” location will default to the 90 day storage yard with an option to override. This location will be a variable in the system so it can be change on each handheld.



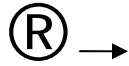
### ***Finalize Container***

There will be a report which will list containers that are approaching their 90 day limits. There will also be an email that is automatically generated each day which will list the containers which have been in the yard 55 days or greater. When the work order is emailed to ChemThink Distributors, a copy of the email will be printed. The user will go into the 90 day yard, find the container ID and with the handheld device execute the following procedure.

- As before, the user will select his ID from a list.
- The user will type the work order number on the keyboard
- The user will press the “F4” key to finalize this container. When the handheld is updated the container will be flagged as deleted but remain in the system. It will no longer show up on any 90 day list and it will be moved to a location we will setup called “Retired.” The computer user will be able to print up reports on retired items at any time.

Sample screens follow:

ChemTrack Mobile  
MAIN MENU  
F1=Move / Deliver  
F2=Return Haz Waste  
F3=Finalize Container  
F4=Inventory  
F5=Inquire  
F6=Send /Receive



ChemTrack Mobile  
Finalize Container  
User ID:  
Wade  
Work Order: 12347  
Container ID:  
3263827  
F4 = Finalize Container  
Esc=Quit

## **Recommended Solution Description – Waste Water Treatable**

The current process involves 3 work orders, one for moving the empty container to the department or facility in which it will be used and the other for moving the now full container to WWT and the third to scrap the container. If for any reason more moves are required it will be acceptable to use the “Move” transaction on the handheld.

### ***Empty Container Pickup***

A work order is generated at ABC Chemical Company and transmitted to ChemThink Distributors. At the ChemThink Distributors yard our new process will begin. Before any tracking can occur a barcode needs to be placed on the container. The barcode will be generated in the ChemThink Distributors trailer from a PC workstation which will be connected to the network with access to ABC Chemical Company’s SQL Server. The user will enter:

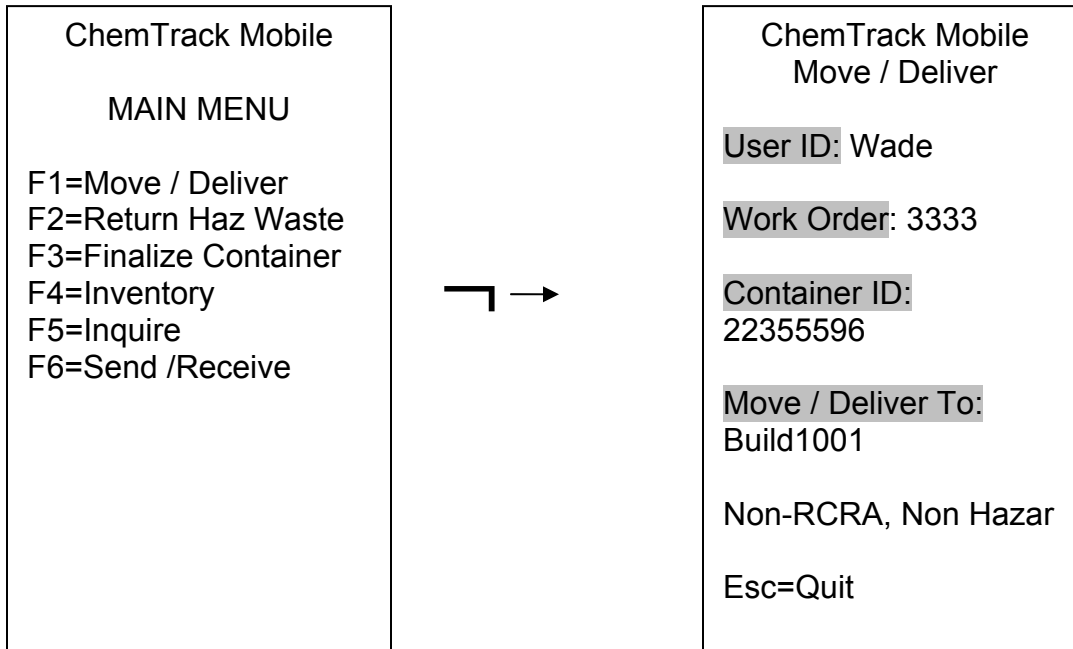
- Delivery User (Selectable from a list)
- Work Order Number (Typed)
- Profile ID Number (Selectable from a list). It is suggested that these be added by ABC Chemical Company. ChemThink Distributors will not be able to add new profile ID. WWT profiles might be simply “WWT-1”, “WWT-2”. In order for the system to work a profile / product will need to be assigned to each container. It is understood that not every item currently has a profile. We recommend making new “Profile ID’s” for materials without a profile. Up to 4 profile numbers can be entered for a container. We will require at least one profile number with each container.
- Delivery Location (Selectable from a list)

A “Container ID” Barcode will be automatically generated. This will be a unique number that will be automatically generated and will not repeat in the system. After the data is entered and “committed” to the system a 4 x 6 barcode will be automatically generated. A sample of this barcode is found later in this document.

The barcode will be placed on the container and delivered to the proper location. The container will be assigned to a location called “In Transit”.

### ***Empty Container Delivery***

The delivery person will drop off the container at the correct building. At the time of delivery the container will be scanned with a portable data collector. The interface will look like the examples below:



The user will select the “UserID” from a list. The “Work Order” number will be entered on the keyboard. The “Container ID” will be scanned from the container and the “Deliver To:” will be selected from a list. (Optional: - We could have barcodes in a notebook for the “Deliver To”. Large lists are not easy to navigate.)

The transaction will be saved and time and date stamped.

### **Remove Filled WWT Container**

The user will use the “Move Container” function on the handheld. The behavior will be the same as above but the user will select “In Transit” as the “Move / Deliver To” location.

### **Arrival at WWT**

The User will use the “Move / Deliver” function on the handheld. The “Deliver To” location will be “WWT.”

### **Finalize Container**

We will use the same routine that is used for “Hazardous Waste”. See the “Hazardous Waste” section for a description of that procedure.

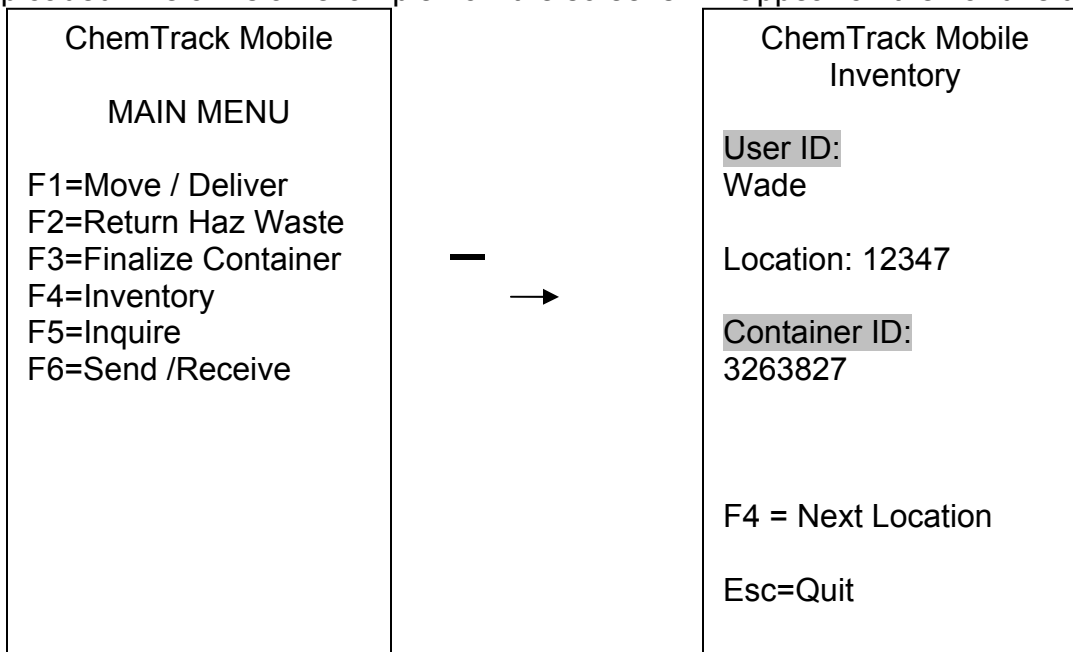
## Virgin Materials Handling

Really, there is no difference between Virgin Materials and WWT. The only distinction is that the “Product ID” will be selected in place of a “Profile ID” when the process is started. Additionally we will prompt for “Invoice Number” if the selected product is “Virgin”. The other difference is that a 90 day clock will not be started at any time in the process. The user that initiates the initial delivery will be responsible to make sure that the correct product is selected. The system will only set 90 day limits on items that are waste. So if the user selects the correct product, no clock will ever be initiated.

## Inventory

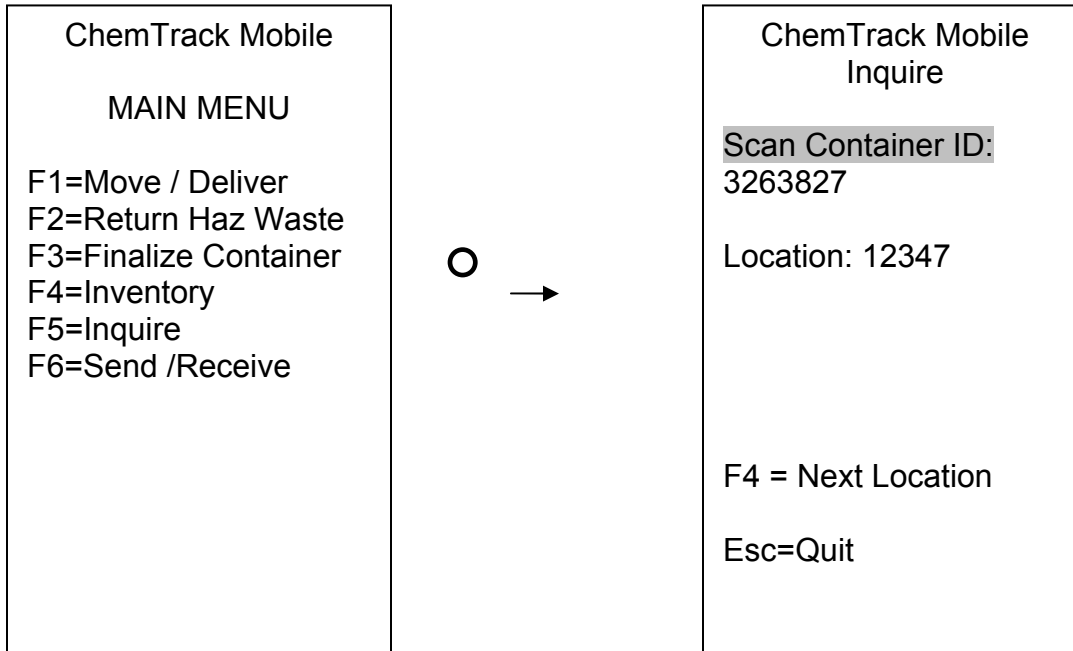
Inventory will be taken on demand with the handheld devices. The user will scan the location and then the barcodes in that location. The handheld will loop on “Barcode” so that the user will only need to scan the location once. There will be a “Next Location” function which when activated will have the handheld prompt the next location and so on.

If a container is in the wrong area it will be moved once the handheld is uploaded. Below is an example how the screens will appear on the handheld.



## Inquire

At any time a user with a handheld can scan a container and the unit will display it's last known location. In this manner containers that are "out of place" can be relocated back to where they belong.



## System Details

The system will be an Access XP program which will be linked to a SQL database. This REQUIRES network connectivity to each PC including the one that ChemThink Distributors will be using. The SQL database will be placed on an SQL server at the ABC Chemical Company facility. By accepting this quotation ABC Chemical Company agrees to host the database on their servers and they will cooperate with American Barcode and RFID to install the software on said servers. This program will require Access XP in order to be modified or have custom reports generated. American Barcode and RFID will install an Access XP runtime on PCs that do not have Access and do not need this ability.

Below are a few details common to more the one process. They appear here to keep this document concise.

### **Data Structure**

There will be 5 tables that will encompass the system. It is understood that a "Product" and "Profile" are not the same thing, however for the sake of consistency it is our recommendation that those two item types exist in the same table. The table names, field names and sizes are listed below:

## Items Table

Field Name	Field Size	Field Type	Field Description
Profile / Product ID	15	AlphaNum	Key - Relates to Container table
Description	50	AlphaNum	
Alt Description	50	AlphaNum	
Type	3	AlphaNum	HW,WWT or V
Hazard Class	8	AlphaNum	
UN#	15	AlphaNum	
PG	8	AlphaNum	

## Container Table

Field Name	Field Size	Field Type	Field Description
ContainerID	15	AlphaNum	Key
Department	15	AlphaNum	
Building	15	AlphaNum	
Product/Profile	15	AlphaNum	Material inside the container
ContainerType	15	AlphaNum	
Weight	8	Numeric	
Active	1	Yes / No	Changed to No when container is finalized

## History Table

Field Name	Field Size	Field Type	Field Description
TransactionID	15	AlphaNum	Key for history table
ContainerID	15	AlphaNum	
WorkOrder	15	AlphaNum	
InvoiceNumber	15	AlphaNum	
TransactionType	15	AlphaNum	Transaction types - New, Move, Finalize etc
TimeDate		Time/date	
User	15	AlphaNum	User for this transaction

## Locations Table

Field Name	Field Size	Field Type	Field Description
BuildingID	15	AlphaNum	Key for building table
Description	25		

## Departments Table

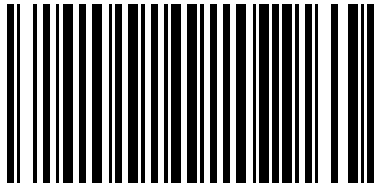
Field Name	Field Size	Field Type	Field Description
DepartmentID	15	AlphaNum	Key for building table
Description	25	AlphaNum	

## Users Table

Field Name	Field Size	Field Type	Field Description
UserID	15	AlphaNum	Key for user table
Password	25	Password	
UserLevel	1	Numeric	1 for ABC Chemical Company, 2 for ChemThink Distributors
EmailAddress	50	AlphaNum	Used for automatic email
SendHWList	1	Yes / No	Yes if user is to receive daily email

## Sample Barcode

The recommended label type is a Zebra 4 x 6 Z-Ultimate 3000. Below is a sample of how the barcode will look.

	ABC Chemical Company ChemTrack
Container ID:	
	
<b>3263827</b>	
Profile: 301143	
Non-RCRA, Non hazardous waste liquid(Ammonium Copper Strip Solution	
EPA Waste Code:	
N/A	

## PC Program

### ***New Container***

This function on the PC will be what ChemThink Distributors uses to issue a new container. We will allow the user only to add new records. If a mistake is made ABC Chemical Company will be notified to fix it. (It would be easy to allow ChemThink Distributors to correct mistakes but we weren't sure if you wanted to

**New Container**

Delivery User: Wade

Container ID: 111144

Select Profile: 33301143

Invoice Number:

Work Order: 11

Department: Testing

**Product / Profile Information**

Product Type = Hazardous Waste

Product / Profile ID: 301143

Description: Ammonical Copper Strip, Bldg. 422,55-00

Alt Description: Non-RCRA, Non hazardous waste liquid(Ammonium Copper Strip Solution)

Hazard Class:

EPA Waste Code:

Print Barcode

Cancel New Cont

Save and Reset

Save and Close

### ***View / Edit Container***

This form will allow the user to search any container either current or finalized. The user will be able to:

- View / Edit container details including a "Move" function to relocate a container.
- Delete containers
- View history
- Print
- Re-print barcode

Inbound Form

## View Container

**Select Container:**

**View Type:**  
 Search Current  
 Search Finalized

**Delivery User:**

**Container ID:**

**Select Profile:**

**Invoice Number:**

**Work Order:**

**Department:**

**Building:**

**Product / Profile Information**

**Product Type = Hazardous Waste**

**Product / Profile ID:**

**Description:**

**Alt Description:**


**Hazard Class:**


**EPA Waste Code:**


**Container History**


HistoryID	TransType	Binloc	Date	TimeOfOrder
725	New Lot	Receiving	11/20/2001	2:29:42 PM
726	New Lot	Receiving	11/20/2001	2:29:42 PM
727	New Lot	Receiving	11/20/2001	2:29:42 PM
728	New Lot	Receiving	11/20/2001	2:29:42 PM
729	New Lot	Receiving	11/20/2001	2:29:42 PM
730	New Lot	Receiving	11/20/2001	2:29:42 PM


Record: 1 of 107548

  
**Print  
Barcode**

  
**Move  
Container**

  
**Cancel  
New Cont**

  
**Save and  
Reset**

  
**Save and  
Close**

### **Add / Edit Product Profile**

This will be a simple form in the same general format as the previous examples which will allow the user to do the following:

- Add a new product / profile
- Edit existing product / profile
- Update product / profile with excel file
  - Sample files will need to be submitted before work begins.
- Delete product / profile with excel file.
  - Sample files will need to be submitted before work begins.
- Print product / profile

### **Add / Edit User**

This will be a simple form in the same general format as the previous examples which will allow the user to do the following:

- Add a new user
- Edit existing user including password management
- Delete User

### **Add / Edit Location (Building)**

This will be a simple form in the same general format as the previous examples which will allow the user to do the following:

- Add a new user
- Edit existing user including password management
- Delete User

### **Add / Edit Department**

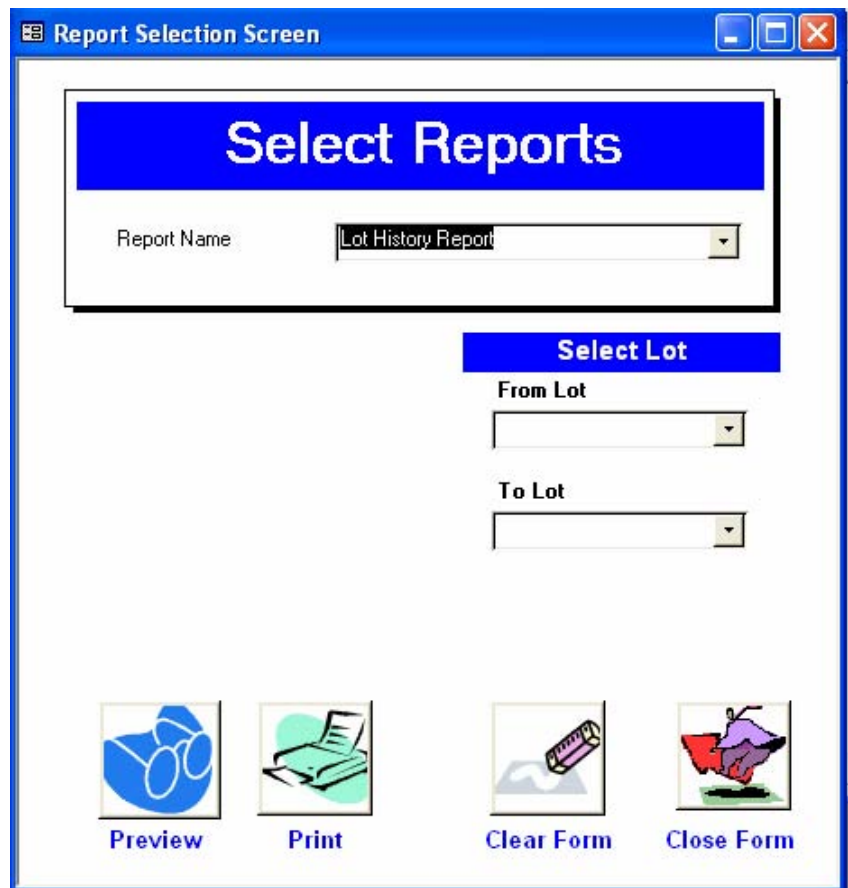
This will be a simple form in the same general format as the previous examples which will allow the user to do the following:

- Add a new department
- Edit existing department
- Delete Department

### **Reports**

There will be a select reports form like the example to the right. The following reports will be included:

- Container history selectable by container.
- Waste 55 days old or greater.
- History selectable by date.
- Inventory selectable product / profile (includes total weights).
- System usage by "Department".



Report Selection Screen

**Select Reports**

Report Name: Lot History Report

**Select Lot**

From Lot

To Lot

Preview Print Clear Form Close Form

## Send / Receive

The handhelds will need to be “Synched” with the PC. This can be done at any time but it is understood that any data the handheld collects will not be in the system until that handheld is “Synched” with a PC.

To synchronize a handheld the user will execute a “Send” function on the handheld and a receive function on the PC. The user will place the unit in its docking station and the synchronization will occur.

## Auto Email

Each morning an email will be generated automatically to each user in the system that has that feature activated. This email will be in Excel form and list all waste containers that have been in the system for 55 days or greater.

## Software and Services Pricing

This pricing is for the system as described in this document. Any request for change may influence the price in either direction. We “recommend” a number of days for installation and training. If additional days are required they can be obtained at the cost of \$1200 per day.

<b>Item</b>	<b>Number of Days</b>	<b>Price / Day</b>	<b>Item Total</b>
Software Programming	10	\$1,200.00	\$12,000.00
Installation / Training	2	\$1,200.00	\$2,400.00
1 Year Support (Flat Rate)	1	\$1,000.00	\$1,000.00
		<b>Total</b>	<b>\$15,400.00</b>