County of Santa Cruz

DEPARTMENT OF PUBLIC WORKS

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THOMAS L. BOLICH
DIRECTOR OF PUBLIC WORKS

AGENDA: SEPTEMBER 18,2001

September 6, 2001

SANTA CRUZ COUNTY BOARD OF SUPERVISORS
701 Ocean Street
Santa Cruz, California 95060

SUBJECT: CONSTRUCTION AND DEMOLITION WASTE RECYCLING

Members of the Board:

On June 5, 2001, your Board considered a letter from Public Works requesting deferral of a report on the proposed construction and demolition waste recycling program (C&D) to September 18, 2001. Public Works was directed to return with a report and recommendations on administration of the program and a summary of the comments from meetings with construction and hauling industry representatives regarding C&D materials recycling program options. Your Board also directed Public Works to return with recommendations on program design and staffing requirements for a C&D recycling system at the Buena Vista Landfill. The following report addresses both C&D program components.

On February 27, 2001, Public Works submitted a report to your Board outlining options for increasing recycling of C&D waste. C&D waste, according to our May 2000 waste characterization study, comprises the largest single component of recoverable waste still being disposed in the County's Buena Vista Landfill. Diverting this material for recycling and re-use will not only help to extend the lifespan of the Buena Vista Landfill but will also help the County reach the 50 percent landfill disposal reduction mandate (AB 939) imposed by the State. It is estimated that approximately 24,000 tons of C&D related wastes and 5,000 to 10,000 tons of commercial waste with characteristics of C&D waste are entering our Buena Vista Landfill each year. C&D materials typically have large amounts of lumber, cardboard, metal, sheetrock, asphalt, concrete, carpeting and padding, architectural fixtures, and roofing. All these materials are recyclable or reusable. The County is currently at an estimated 44 percent diversion rate and the proposed C&D program components discussed in this report are estimated to increase our county-wide diversion by the six percent to eight percent needed to meet the State mandate. This would represent a diversion of approximately 18,900 tons of C&D waste per year into the County's recycling program. (Please refer to attached cost/benefit summary for additional background material.)

A number of possible options were presented to your Board on February 27, 2001 (see Attachment A), the two most significant being 1) establishment of a C&D waste recycling system at the Buena Vista Landfill, and 2) possible enactment of a County ordinance to require C&D recycling as part of the building permit process. This report includes discussion of both the proposed C&D waste recycling system at the Buena Vista Landfill and the results of our meetings with the waste hauling and construction industries regarding the C&D waste program and proposed ordinance.

C&D Waste Recycling System

On February 27, 2001, we reported to your Board on the results of a formal Request for Proposal that was issued in December 2000, soliciting contractors interested in developing and operating the proposed C&D waste recycling system at the Buena Vista Landfill. We received no proposals. **As** a result, your Board directed Public Works to develop equipment and staffing requirements for a County operated facility. Public Works and our solid waste consultant, GeoSyntec, have reviewed several existing C&D waste recovery operations at other landfills to determine the most appropriate equipment and staffing requirements for a C&D recycling system at the Buena Vista Landfill. Attachment B is a report which includes an operational plan, schematic flow diagram, and cost summary for the proposed C&D waste sorting line. Sorting line equipment specifications for the sorting line are included with this attachment.

Attachment B also outlines Public Works' recommendation for six new staff positions to operate this program, including one Heavy Equipment Operator and five Disposal Site Maintenance Workers. Public Works had developed an operating budget for the proposed 2001/2002 budget for this program, which included an estimated annual operating expense of $586,000 for administration, staffing and maintenance costs, and a one-time capital expense of $750,000 for the sorting line and mobile equipment. However, at the time of budget preparation, the proposed project was still undergoing some developmental changes and the funding was temporarily moved into contingencies pending future action by your Board. In order to implement this program, your Board will have to approve the attached transfer of funds from contingencies into the various operating and capital improvement accounts in the CSA-9C, Solid Waste and Recycling Budget. Sufficient funds are available for this purpose.

Industry Meetings on C&D Waste Recovery

Since February staff has met with involved parties (debris-box haulers and the construction industry) to gather input on the most effective operational and regulatory approaches to pursue regarding C&D waste diversion. All meetings were well publicized in advance of the scheduled meeting dates. Attendance at these meetings was very light; however, those who did attend provided valuable input.

Debris-box haulers reported that their experience in other communities was that C&D waste generators were most likely to use a single on-site container for mixed C&D waste and that separating materials on the job site was problematic due to space limitations and added labor costs. This sentiment was also expressed by the Santa Cruz County Builders Exchange (see Attachment C), which advocated for mixed C&D waste collection and processing at the landfill with gate fee incentives but did not support additional building permit conditions and fees, or ordinance changes. A public forum on this topic was also held with general contractors on April 19, 2001. Public Works received similar comments emphasizing support for creating a local C&D recycling system and expanded recycling assistance but disfavor with the addition of more building permit conditions and fees. For contractors, having a greater local opportunity to recycle C&D materials without further restricting building permits was the most attractive option being proposed by the County.

On March 23, 2001, we also met with the representatives from the local debris box hauling industry to discuss their role in C&D waste recycling. Although they all agreed that complete separation of materials at the job site is optimal, from a practical standpoint partial separation (i.e., separating trash from mixed recyclables) appeared to be the most realistic option discussed. However even for this approach to work, separate or partitioned collection containers would need to be available at competitive rates. Local debris-box haulers were not supportive of this approach, maintaining that partitioned containers are too expensive to build or retrofit, do not work well in the field and their experience is the generators do not properly segregate materials and do not use them correctly anyway. Collection of mixed C&D waste for processing at a local facility was the most favorable of the program options discussed.

C&D Ordinance

As previously discussed with your Board and outlined in Attachment **A,** the option of adopting a C&D recycling ordinance would assign the responsibility for recycling directly to the generator (contractor, builder, homeowner), requiring them to develop a project waste reduction plan with a measurable goal (i.e., 50 percent), document total quantities of waste materials generated from a job, how much was recycled, and where it was recycled. In other jurisdictions with existing C&D ordinances, failure to meet these basic requirements typically results in some form of enforcement action such as forfeiture of a pre-project deposit, a post-project fine, or withholding of a building permit sign-off. While our feedback from the construction and hauling industry was limited, those who did respond maintained a common theme of disfavor for implementation of such a C&D ordinance.

In an earlier report, we informed your Board that the County is very close to meeting the 50 percent waste diversion mandate of AB 939 (currently at approximately **44** percent, as noted earlier). The proposed C&D recycling system at the Buena Vista Landfill is projected to divert more than enough C&D waste to take us over the 50 percent diversion milestone without implementation of a mandatory C&D recycling ordinance. However, implementation of such an ordinance at some future date could still be used to hrther enhance our future waste diversion efforts if voluntary participation by the business and construction industry falls short of expectations.

Summary

Whil.ewe have discussed a number of actions that would support an increase in C&D recycling, the most important step is the creation of a C&D material sorting system at the Buena Vista Landfill. Regardless of what other steps are taken, this is the one most basic action that makes possible all other ancillary activities to further C&D recycling. This is especially so in Santa Cruz County because of the absence of a private C&D recycling industry, such as those found in the San Francisco Bay Area and other metropolitan centers. Unlike in the Bay Area, simply to mandate that the building industry recycle is problematic because there are no local sorting facilities (private or public) to which they can deliver their recoverable materials. Therefore, this first step should be taken immediately while work can continue on the other supporting activities such as outreach, rate incentives, and ordinances. Once the sorting system is up and running, staff will evaluate if it is meeting our diversion objectives and if further consideration should be given to some of the more obligatory approaches outlined in Attachment A, such as an ordinance or landfill bans on recyclable materials.

Based on the information we received, our conclusion is that the best direction, initially, is for the County to create a local C&D recycling system at the Buena Vista Landfill and seek voluntary cooperation from the building industry and debris-box haulers in fostering widespread use of this facility. This would entail 1) establishing a C&D processing system at the Buena Vista Landfill as discussed above, 2) providing expanded recycling outreach and technical assistance to the construction industry, and **3)** deferring action on establishing a mandatory C&D recycling ordinance for one year from the time the new C&D recycling system is up and running in order to ascertain how well the voluntary approach is working and what level of added diversion is being achieved.

It is therefore recommended that the Board of Supervisors take the following action:

1. Accept and file this report on construction and demolition waste recycling.

2. Approve the attached transfer of funds from CSA-9C Solid Waste and Recycling contingencies in the amount of $586,000 for operations and maintenance activities and $750,000 for the purchase of various capital equipment necessary to implement the construction and demolition waste recycling program.

3. Approve the addition of six full-time equivalent staff positions, including one Heavy Equipment Operator and five Disposal Site Maintenance Workers, for the construction and demolition waste recycling system and direct Personnel to appropriately classify these positions.

Yours truly,

THOMAS L. BOLICH
Director of Public Works

RPM:mg

Attachments

RECOMMENDED FOR APPROVAL:

County Administrative Officer

copy to: GeoSyntec, Sangeeta Lewis
Personnel
Public Works

Attachment A

SUMMARY OF POSSIBLE OPTIONS FOR A CONSTRUCTION AND DEMOLITION RECYCLING PROGRAM

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1. RECYCLING PROCESSING SERVICE

A. Public Works is developing a recycling processing system at the Buena Vista Landfill to separate loads of mixed Construction & Demolition (C&D) waste and some commercial wastes for recycling. Clean loads of mixed C&D waste typically contain only recyclable materials such as lumber, cardboard, metals, sheetrock, asphalt, concrete, carpeting and padding, architectural fixtures and roofing with no other non-recyclable contaminants.

B. Public Works would identify the specific C&D waste materials that can be included in the mixed loads for recycling processing.

C. The County may require no additional charge above current disposal rates for this service and may even consider a future rate reductions for clean C&D loads as discussed below.

2. COUNTY BUILDING PERMIT

A. The County could add a condition to the existing Building Permit requirements for the preparation of a C&D waste diversion plan which estimates amount of total waste generated from permitted new construction, remodels or demolitions. The plan would identify the amounts to be disposed and recycled, where the material will be recycled and the quantities of materials actually recycled and materials actually disposed.

B. Permit condition could be applied only to projects above a certain size and the recycling requirement would have to be at least 50%. Applicants for demolition projects would be encouraged to consider deconstruction in order to salvage reusable materials to the extent feasible.

C. Public Works could assign dedicated staff to work with Building Permit Applicants to complete this form, expedite the associated Building Permit processing, and provide in-field assistance with recycling service needs, as described below.

D. Compliance options for failure to meet the recycling plan diversion requirements: voluntary (no penalty); pre-project refundable deposit; or post-project penalty fee.

3. COUNTY RECYCLING ASSISTANCE SERVICES

A. For recycling, Public Works will provide expanded educational information and site-specific technical assistance in identifying targeted materials, and establishing optimal on-site separation techniques and systems, and identifying all available recycling options or waste exchange opportunities.

B. For deconstruction, Public Works will provide educational information and site-specific technical assistance in identifying targeted materials, in establishing optimal on-site separation

techniques and systems, and identifying all available deconstruction options.

4. DISPOSAL RATES - INCENTIVES

A. The County could establish a landfill gate fee for clean loads of mixed C&D waste delivered to the Buena Vista Landfill that is lower than the rate for disposal of general refuse. See 1A above for the definition of clean C&D loads.

B. The County will maintain its current disposal rate structure that allows deposit of separated recyclable materials at discounted rates, such as concrete/asphalt and wood/yard waste, and deposit of other recyclable materials at no charge, specifically cardboard and metals. Contractors, businesses and homeowners will continue to be encouraged to separate materials before coming to the landfill to benefit from the lowest possible rates.

5. DEBRIS BOX HAULER SERVICES

A. The County could establish a permit system for debris-box haulers operating in the unincorporated areas which could require haulers to offer 'recycling collection service' for mixed loads of clean C&D waste, as defined in 1**A** above.

B. Such service could include provision of a partitioned debris box or other form of collection service which can be used on the job site for the separate deposit of refuse and mixed C&D recyclable waste.

C. The cost of such service may also reflect disposal cost savings.

6. LANDFILL BANS FOR TARGETED MATERIALS

A. The County could prohibit certain targeted materials (i.e., recoverable C&D materials) from entering the landfill for disposal. Clean separated loads would be accepted for recycling, but mixed loads containing such materials would be turned away or directed to separate before disposal.

7. DISPOSAL RATES - DISINCENTIVES

A. The County could establish a disposal rate surcharge or premium to be charged for loads arriving for disposal which contain recoverable C&D waste or landfill banned materials, as described above.

8. USED BUILDING MATERIALS EXCHANGE

A. The County is considering establishing a facility at the Buena Vista Landfill or other location for the deposit of used, but still usable, building materials. Builders could leave materials and also obtain materials such as architectural fixtures, lumber, etc.

ATTACHMENT B

CONSTRUCTION AND DEMOLITION WASTE RECYCLING SYSTEM REPORT BUENA VISTA LANDFILL

Our County is currently diverting approximately **45%** of our waste from landfilling through a variety of curbside and landfill based recycling and waste reduction programs. Construction and Demolition (C&D) wastes make up the single largest individual wastestream still entering our landfill and represents the best opportunity to further reduce the amount of waste entering our landfill. In addition to C&D wastes, we also receive significant numbers of commercial waste loads that have a high percentage of recyclable materials. It is currently estimated that approximately 24,000 tons of recoverable C&D related wastes are entering our Buena Vista Landfill each year along with an additional 5,000 to 10,000 tons per year of recoverable/recyclable commercial and business waste. A recoverable load is defined as load with at least 50% recyclable material content. Recovery efficiencies are very low when recycle content is less than 50%. C&D materials and many types of commercial waste loads are typically over 50% recyclable and contain large amounts of lumber, cardboard, metals, sheetrock, asphalt, concrete, carpeting and padding, architectural fixtures and roofing. All these materials ai-e recyclable or reusable with the proper equipment and staffing.

Under this new program, customers arriving at the facility will be directed to one of four receiving areas at the.landfill:

- (existing) Unsorted, non-recoverable loads of refuse will be directed to the landfill for direct burial.
- (existing) Clean loads with a single recyclable material such as yardwaste, concrete, cardboard or scrap metal will be directed to the on-site processing area for each commodity.
- (new) Small loads (ie cars, pick-ups and vans) with mixed recyclables will be directed to a public sorting area where the customer can sort the material into recyclable categories as it is unloaded and County staff will be responsible for moving the materials to the processing areas as needed.
- (new) Drop boxes and large commercial loads will be directed to the Mixed Construction and Demolition Material Tipping area for processing on the C&D sorting line as outlined below.

Public Works is proposing to install and staff a portable C&D sorting line at the Buena Vista Landfill to accomplish diversion of C&D and commercial wastes. The proposed sorting line consists of several components and a staff of waste "sorters" and a heavy equipment operator.

-Construction and Demolition Recycling Facility- **Attachment B**

The following outline of equipment, staff and waste flow should be reviewed in conjunction with the attached equipment schematic:

1. Traffic Spotter: The Traffic Spotter is an existing position at the landfill and is responsible for managing incoming traffic and directing customers to the appropriate tipping areas for each type of waste. The Traffic Spotter is located near the entrance to the landfill operations area. The staff person will inspect each load prior to allowing the vehicle to enter the operational section of the landfill and then direct the load to one of three material tipping areas: Mixed C&D Material Area, Small Load Public Sort Area, or Landfill. Single material recyclable loads are charged a discounted rate at the gatehouse and sent directly to the material processing areas at other locations on-site.

2. Mixed C&D Material Tipping Area: Drop boxes and other large volume vehicles with mixed C&D waste and recoverable commercial waste will tip their loads on the ground in this area. A track mounted excavator will then pick out large recyclable items and stockpile them for transport to the appropriate on-site material processing area. The excavator will then load the remaining materials into the pre-screening/metered feed. This area of the C&D sorting line requires a minimum of one full-time Heavy Equipment Operator to run the excavator, transport full drop boxes to the on-site processing areas and oversee C&D operations.

3. Pre-Screening Unit: The Pre-Screening Unit is a vibrating screen that is used to remove small material such as dirt, broken glass, and small metal items from the incoming wastes prior to hand sorting operations. The screening unit then meters the remaining materials onto the sorting line to improve sorting efficiency.

4. Unders: The small material screened out of the incoming waste (commonly referred to as "unders") will be used as alternative daily cover on the landfill to supplement soil use. This material is stockpiled on the ground via conveyor belt at the back of the pre-screening unit and is periodically hauled away with earthmoving equipment and stockpiled for future cover landfill use. Prior to discharge from the stockpiling conveyor belt a magnet is passed over the unders to remove small metal items such as nails and screws. This material is collected in a small bin and recycled with other scrap metal collected on-site.

5. Pre-Sort Picking Station: A conveyor belt transfers material from the pre-screening unit to the sorting line area. Typical sorting operations have a pre-sort picking station located on this conveyor belt feed section which is used to remove odd shaped and oversized items that may interfere with efficient sorting such as large cardboard pieces and carpet. This material is thrown to the ground below the picking station and periodically collected and transported to an on-site material processing area. This

section of the C&D sorting line requires one full time sorter.

6. Sorting Line: The sorting line itself consists of a 5-6 foot wide conveyor belt with up to four picking stations on each side of the belt. The sorting line is elevated and each staff sorter will remove a designated type of material and drop it in a chute that empties into a portable debris box below. This section of the sorting line requires 4 to 8 full time sorters, at a minimum of one per material type or more if incoming volumes warrant.

7. Waste Overflow: All non-recyclable material is left on the conveyor belt and deposited in a pile at the end of the conveyor line for transfer to the landfill's active disposal face. The portable sort line will be located near the active landfill face to simplify transfer of refuse.

8. Mobile Eauipment: In addition to the sorting line equipment, the operation will be supported by a debris box carrier to move full debris boxes from the sorting area to on-site recycling processing areas, six to eight debris boxes, and a track-mounted excavator for large material separation and sort line feeding. Purchase of the track-mounted excavator was previously approved by your Board on March 27,2001 , to allow for some limited C&D waste sorting while the full scale sorting operation is under development.

9. Small Load Public Sort Area: One of the consistent comments we receive from customers is that the facility is inconvenient for customers with mixed loads of recyclables. Due to the limited space at the facility, recycling operations are spread out over several remote areas of the landfill. Customers with mixed recycling loads must travel to two or more areas of the site to deposit their loads which can take extra time and add to on-site traffic. The public sort area will allow customers with mixed recyclable loads to drop all their materials in one area, reduce the customer's on-site time and traffic. As piles of recyclables develop, they will be commingled with the sorted C&D materials for eventual transport to on-site material processing areas.

At full capacity, the proposed sorting operation could utilize up to 12 full time employees, 5 days per week: two (2) Heavy Equipment Operators, nine (9) Sorters and one (1) additional spotter. However, we are only recommending an initial crew of 6 to begin the operation. It is proposed that at the end of one year's operation cycle, we will evaluate the success of the program and determine if additional staffing would be beneficial and cost effective. Future planned outreach efforts to home owners and contractors, may have a positive impact on the quality and quantity of future C&D wastes allowing for continuation of a more scaled back operation.

Our initial staffing level recommendations include four waste sorters on the conveyor line,

one waste sorter either on the pre-sort conveyor or assisting with traffic spotting at the tipping area, and one heavy equipment operator to load the conveyor, pre-sort large recyclable items, transport materials on-site, and oversee all the sorting operations. Existing landfill staff will be utilized as available to supplement the operations and to perform equipment maintenance.

Attached is a schematic diagram with numbering for each process coinciding with numbered process discussions above. Also attached are the sort line equipment specifications and cost estimate, and a program cost summary. The program cost summary also provides a breakdown of the individual materials that may be diverted through this program.

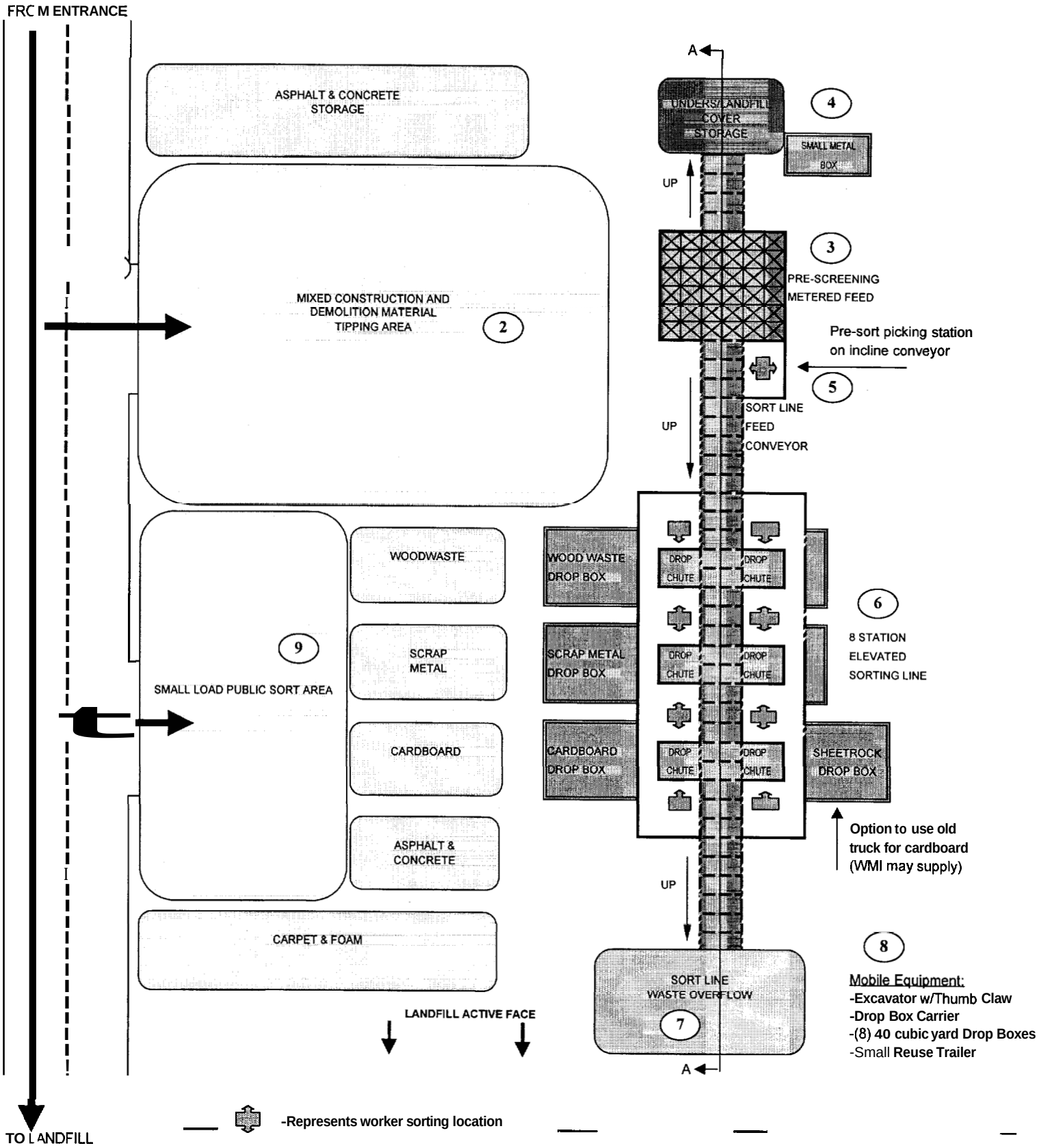
The process described above is commonly referred to as a "dirty" sorting operation. The Monterey Regional Waste Management District in Marina operates such a facility and maintains a respectable a 60% recovery rate. This recovery rate can also be improved upon in the future as the program matures through additional staff and/or implementation of a C&D ordinance as discussed below.

Public Works has previously discussed the option of creating an ordinance to require contractors, builders and home owners to sort and separate construction debris generated from County permitted building projects. This approach is being used successfully in several communities across California. Debris from permitted projects would have to come to the landfill fiee of non-recyclable refuse, but it would be acceptable to commingled several types of recyclable materials together. This is analogous to our curbside recycling program where recyclable materials are commingled together, but separated fiom refuse, which in turn make the sorting much more efficient and cost effective. This is commonly referred to as a "clean" sorting operation. We estimate that under this type of operation we could conceivably increase recovery rate to as much as 85%.

The final and most significant benefit from this program is the extension of the Buena Vista Landfill's life which is approximately 18 years. Under the proposed C&D material recycling program, we estimate reducing incoming refuse by approximately 12% which translates to over 2 additional years of landfill life.

BUENA VISTA LANDFILL CONSTRUCTION AND DEMOLITIONWASTE SORTING LINE

(CONCEPTUAL)



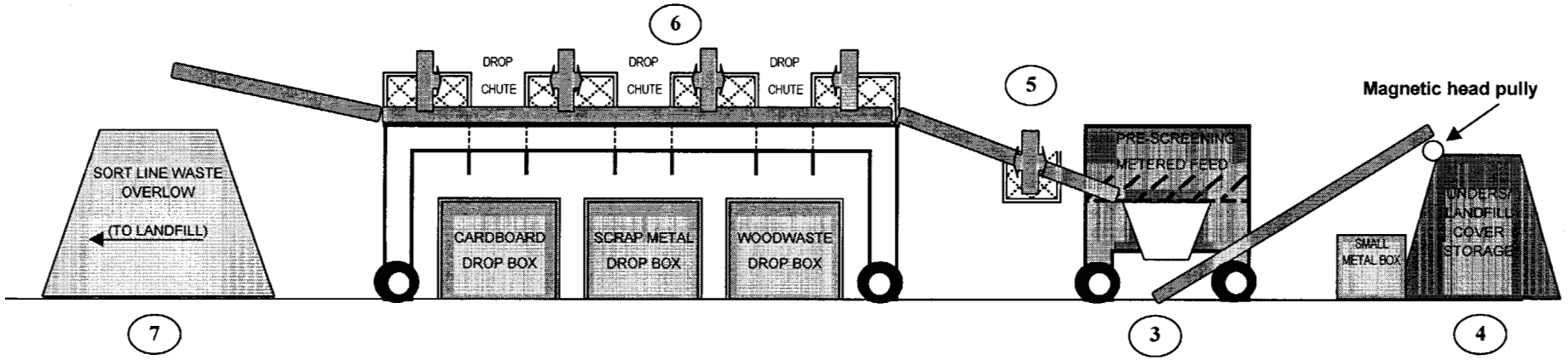
-Represents worker sorting location

-Sorting line to include shed roof and/or enclosure for picking stations.

BUENA VISTA LANDFILL CONSTRUCTION AND DEMOLITION WASTE SORTING LINE

(CONCEPTUAL)

CROSS SECTION A



-Represents worker sorting location

-Sorting line to include shed roof and/or enclosure for picking stations.

CONSTRUCTION AND DEMOLITION WASTE RECYCLING OPERATION
COST/BENEFIT SUMMARY

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C&D Waste Stream Diversion

Waste Stream Generation Projections			
Construction and Demolition Waste:		24,700	tons per year
Commercial/Business Waste:		6,800	"
Total:		31,500	tons per year
Sorting Line Recovery Rates (used Marina LF data)		60%	Recovery Rate
Projected Waste Diversion Per Year		18,900	tons per year[1]

Operational Costs

Capital Equipment Costs			
Sorting Equipment*:	$575,000	$28,750	per year
Life:	20 years		
Mobile Equipment[2]:	$325,000	$32,500	per year
Life:	10 years		
Annual Operatine Costs			
Staff		$466,000	per year
O&M:		$120,000	per year
Annual C&D Waste Sorting Costs:		**$647,250**	**per year**

Post-Recovery Costs/Benefits

Costs/Benefits After Processing;		
Post-Recovery Processing Costs[2]:	$164,694	per year
Added Landfill Life[3]:	2.35	years
Revised Landfill Life (currently 18):	20.35	years
Cost Savings of Extending Landfill Life[4]:	($153,752)	per year
Total Post-Processing Costs/Benefits:	**$10,942**	**per year**
Total Program Costs:	**$658,192**	**per year**

1. Annual Recycling Estimates (tons per year)

	Annual Wast Generatioq	60% Recovery	Processing Unit Cost/(Revenue)	Annual Cost/(Revenue)
Lumber:	13,400	8,040	$19.00	$152,760
Greenwaste:	6,400	3,840	$19.00	$72,960
Asphalt Roofing Material:	3,900	2,340	$0.00	$0
Concrete:	2,600	1,560	($0.35)	-$546
Scrap Metal:	1,980	1,188	($15.00)	-$17,820
Cardboard:	1,520	912	($30.00)	-$27,360
Misc. (brick, sheetrock, carpet):	1,700	1,020	($15.00)	-$15,300
	31,500	18,900	tons per year	
Post-Recovery Processing Cost:				$164,694 per year

2. See attached equipment list.

3. Increased landfill life calculation

Annual Landfill Disposal:	145,000 tons
Annual C&D Waste Diversion:	18,900 tons
Annual Landfill Disposal Reduction:	13%
Current Buena Vista Landfill Life:	18 years
Estimated Increase In Landfill Life:	2.35 years

4. Represents estimated annualized reduction in depreciation expense over extended landfill life.

Estimated value of landfill structures and improvements over next 18 years:	$24,000,000
Average annual depreciation expense at 18 year landfill life expectancy:	$1,333,333
Average annual depreciation expense at revised landfill life expectancy of 20.35:	$1.179.581
Net annual reduction in depreciation expense:	$153,752

C&D RECYCLING EQUIPMENT LIST

Sorting Equipment

Sorting Line with shaker screen feed: (see attached specifications)	$575,000	new

Mobile Equipment

Track-Mounted Excavator:	$150,000	2000/01 funding
Drop Box Carrier:	$130,000	new
(8) Drop Boxes (varying sizes):	$30,000	new
Stakeside Trailer:	$15,000	new
	$325,000	

PERFORMANCE SPECIFICATIONS

FOR CONSTRUCTION **AND** DEMOLITION WASTE PROCESSING SYSTEM

OVERVIEW

This Construction and Demolition Waste Processing System ((‘System’’) is to be operated at Buena Vista Landfill, near Watsonville, California. It will be in close proximity to the working face of the landfill so that non-recyclable materials may be easily disposed, and so that any Alternative Daily Cover produced by the System may be placed on the landfill with a minimum of transport. As the location of the working face changes, the System will be moved to remain nearby. Accordingly, the system must be portable, and major components of the system must be mounted on wheels or skids so that they can be readily moved across graded but unpaved terrain. The System must be designed to be relocated in less than eight hours using on-site equipment and personnel.

In general terms, the System will consist of the following Components:

1. Finger Screen with Unders Conveyor (with magnetic separation)
2. Receiving Conveyor
3. Elevating Conveyor
4. Sorting Platform with conveyor, work stations for Sorters, and drop chutes
5. Electrical Generator with associated wiring and controls
6. Pump and piping for Finger Screen dust control

The System shall also include controls and wiring sufficient to enable it to function as a unit.

Detailed specifications for each component are provided below. Figure 1 is a schematic diagram showing the relationships among components and other equipment and materials.

FEED MATERIAL

Feed Material for this System will consist of mixed wastes from construction and demolition work, generally including but not limited to the following:

- wood framing, sheathing and scraps;
- wood and/or plastic concrete forms;
- scrap metal, including pieces of concrete reinforcing bars, metal studs, fixtures, conduit and wiring;
- gypsum wallboard;
- film and foam plastic;
- demolished lath-and-plaster, stucco, and other composite wall materials;
- demolished, removed or unused roofing materials, including wood and composition shingles, tar-and-gravel mixtures (not liquid), sheathing, nails and fasteners, metal flashing, gutters and downspouts;
- soil, brick, asphaltic concrete, Portland cement concrete, unit pavers, and similar inert materials, generally in sizes **3'** x **3'** or smaller with minimal reinforcing steel protruding;
- landscaping materials, including irrigation lines and plant materials;
- wood, cardboard, paper and plastic packaging for construction and demolition related materials; and
- miscellaneous refuse generated during site cleanup work.

PRODUCTS

The expected products from the System include, but are not limited to:

- Reusable items and materials;
- Fine material ("unders" from Finger Screen) suitable for use as Alternative Daily Cover or for other purposes;
- Ferrous metal magnetically extracted from "unders";
- Ferrous and non-ferrous scrap metal;
- Corrugated cardboard;
- Wood and plant wastes suitable for grinding and use as mulch, compost or biomass fuel; and
- Inert materials, including concrete, brick, and rock.

BY-PRODUCTS

Items and materials not separated by the System will be landfilled at the site.

THROUGHPUT

Design Maximum Throughput is 35 tons per hour, to assure 200 tons processed per 8-hour shift.

RELATED EQUIPMENT AND SERVICES PROVIDED BY COUNTY

To support the operation of this system, County will furnish the following:

- Sufficient area for operation, generally graded to 3% or flatter slope. Area will include space for stockpiling feed materials and products, and for containers to be placed beneath Sorting Platform.
- Labor for equipment operation and sorting.
- Tracked excavator with thumb-bucket, to sort and feed material to system. Cat 312B, capable of lifting material to 10-foot height if necessary.
- Wheeled loader and tracked dozer, to tow/relocate System as needed, and to push / remove loose products and by-products.
- Roll-off containers, maximum 10 feet in height (when placed on ground), to receive and handle sorted materials.
- Roll-off truck to transport roll-off containers as needed.
- Water truck or portable water tank suitable for connection to System, providing flooded suction to System water pump.
- Diesel fuel for electrical generator.
- All necessary routine maintenance.

GENERAL SPECIFICATIONS AND REQUIREMENTS

Proposed equipment shall comply with the applicable sections of the following:

ANSI 2245.41 - Facilities for the Processing **of** Commingled Recyclable Materials - Safety Requirements

The National Electrical Code and all other applicable **NFPA** Standards. Electrical conduit shall meet applicable ANSI, NEC and NEMA standards. Conduit and conductors shall be UL approved. Electrical control enclosures shall be NEMA **4.**

Rules and Regulations of the Monterey Bay Unified Air Pollution Control District

All equipment shall be primed and painted per ..... [County spec?]

The following specifications shall apply to all belt conveyors:

All conveyors shall be designed to CEMA standards as a minimum.

Conveyors shall be designed for continuous operation and to start fully loaded.

All bearings shall have L - 10 rating life of 60,000 hours. All shaft bearing pairs shall include one fixed and one free and bearing.

Gear reducers and drives and shall be designed for moderate shock and **24** hour service. The reducers shall be Class 2 design.

Lubrication points shall be accessible and shall not required disassembly or removal of components for maintenance.

Conveyor or structural framing shall consist of standard sized steel members. Spacing of supports and hangers shall be to prevent permanent distortion.

Transitions, guides, loading hoppers and chutes shall be constructed of bolted or welded plate assemblies that can be easily removed for maintenance and access. Bolted surfaces shall be reinforced by 2 **x** 2 x ¼-inch angles with holes punched and matched.

Belting shall be furnished. The belt material shall be 3-ply polyester fabric / neoprene rubber or similar with 1/4 inch top cover and 1/16 inch bottom cover.

Belting shall be low stretch, not to exceed 2 percent of the total belt length. The actual length of the belt shall be the designed length plus splice allowance. **All** belts shall be selected to allow startup under fully loaded conditions and withstand the maximum operating tensions resulting from the maximum torque output transmitted by the motor.

Belt splicing shall be mechanical and in accordance with the manufacturers suggested methods, materials, and procedures.

Pulleys shall be of welded steel construction designed for heavy-duty service. They shall be round, concentric, statically balanced, and selected on the basis of belting and belt tension requirements.

For belt conveyors, the pulley face width shall be 2 inches wider, at a minimum, than the belt.

Drive pulley hub shall be keyed to the shaft. Pulley shafts shall be AISI 1045 steel. Shafts shall be designed in accordance with ASME standards, using a minimum shock and fatigue factor for bending of 1.5 and a minimum service factor for torsion of 1.0.

Tail and take up pulleys shall be self-cleaning.

Pillow blocks, flange bearings, and take up bearings shall be heavy-duty, anti-friction, double roller, self aligning, with a minimum life of 60,000 hours. Bearing seals shall be double contact type. One pillow block of each pair shall be expansion type. Pillow blocks larger than 3 1/2 inches shall be furnished with four bolt bases.

Drive motor may be electrical or hydraulic and shall be located at the head shaft. If electrical, motor shall be TEFC 460V 3 phase, installed in accordance with the National Electrical Code. Lubricants shall be added to the recommended levels in all bearings, gear motors, and other lubricated parts before motor is **run.** Prior to operation, motor shall be checked for proper rotation and corrected if necessary. Speed reducer, if needed, shall be **AGMA** class 2 shaft mounted type with oil and dust tight steel or cast iron housings.

Drives shall be complete with adjustable motor mounting, sheaves, V-belts, and guards.

Screw type take ups shall be used. The take ups shall incorporate welded steel frames and zinc plated adjusting screws.

FINGER SCREEN COMPONENT

Finger Screen Component shall consist of the following Subcomponents:
Finger Screen
Dust Control
Unders Conveyor & Magnetic Separator

FINGER SCREEN SUBCOMPONENT

Vibrating deck screen using finger-style decking to sift fine materials from feed material. Stroke shall be adjustable from 1 inch to **2** inches with no change in decking. Deck length shall be determined by vendor, based on performance specifications. Minimum active deck width shall be **72** inches; preferred width is 120 inches. Deck may be stepped, for cascading effect to improve screening efficiency. Height of feed end of deck shall be no more than 10 feet above ground surface. Height of discharge end of deck shall be at least 4 feet above surface of Receiving Conveyor, to enable larger objects to drop onto Receiving Conveyor without overshooting.

Deck gaps shall be nominal 1 inch. Screening Performance requirement: **80** percent screening efficiency[1] of particles less than 1 inch in their largest dimension, at design throughput, from mixed Construction and Demolition material.

Deck gaps may be uniform or diverging. Diverging gaps are preferred, to reduce clogging.

Deck may include impact plates and spreader vanes to distribute material and absorb impact.

Deck strength and support shall be sufficient to permit handling of intended material without damage. For example, a concrete block **2** ft x **2** ft x 2ft, weighing approximately **1,200** lb, should be able to pass across the entire screen during normal operation without causing damage to the decking.

Machine shall be of balanced design, imparting minimal vibratory load to ground surface. Base of machine shall be designed for relocation, by towing, when system is moved. Base of machine shall be sufficiently massive, and machine footprint shall be sufficiently large, so that continuous operation does not cause machine to "walk" or to dig into compacted ground surface. Compaction will be done by grading and wheel rolling the area using heavy landfill equipment, e.g. wheeled loader such as Cat 950, with soil dampened appropriately for compaction.

Housing of lower portion of finger screen (below screening deck and overs discharge) shall be enclosed and sloped to direct all fine materials onto Unders Conveyor, described below. Slope of housing shall be at least 55 degrees from the horizontal plane, to prevent buildup of dust or caked material on housing.

[1] **screening efficiency: fines removed / fines present, expressed as weight percent.**

DUST CONTROL SUBCOMPONENT

Spray bars shall be mounted to lower portion of Finger Screen, to moisten fine material falling through gaps of Finger Screen. Spray bars and associated piping shall be Schedule 80 steel pipe for impact resistance. Flow of water shall be up to 10 gallons per minute, or sufficient to moisten fine material and control dust to the satisfaction of the Monterey Bay Unified Air Pollution Control District, without causing runoff from operation or difficulty in conveying materials (e.g. caking or slurrying). Suggested droplet size range, 100 to 400 microns. Water supply from Pump Subcomponent (see below) shall be up to 100 psig at up to 10 gpm. Water shall be potable quality but not softened. Inlet for spray bars shall be a single brass fitting, 1" NPT female, with gasket. If more than one spray bar is used, each shall be fitted with a readily accessible globe valve to enable independent flow control and shutoff.

UNDERS CONVEYOR & MAGNETIC SEPARATOR SUBCOMPONENT

Troughed-idler belt style conveyor shall be located beneath finger screen to remove fine materials. Discharge end of this conveyor shall be at least 20 feet from nearest portion of finger screen housing and 9 feet above grade. The final 10 feet of this conveyor shall be supported in cantilevered fashion, with no legs below, to facilitate the handling of discharged materials. Head pulley shall be magnetic, with splitter chute directing ferrous metal to container provided by others. Any conveyor framing and parts susceptible to magnetization from head pulley shall be fabricated of stainless steel or other nonmagnetic materials. Chute for ferrous metal shall be directed along return path of Unders Conveyor and shall discharge 4-1/2 to 5 feet above grade.

Return path of Unders Conveyor shall be supported by return idlers.

Tail pulley of Unders Conveyor shall be winged style to promote tracking and prevent buildup of material.

Speed of conveyor shall be set to remove materials at a sufficient rate so that the burden depth does not interfere with magnetic head pulley effectiveness.

Belting shall be furnished. The belt material shall be 3-ply polyester fabric / neoprene rubber or similar with **1/4** inch top cover and 1/16 inch bottom cover.

A zero speed switch shall be mounted at the tail end of the unders conveyor. It shall be wired to cut off finger screen operation if a zero speed condition occurs.

RECEIVING CONVEYOR COMPONENT

Receiving conveyor shall be pan style or armored belt slider-bed style conveyor, sized and positioned to receive materials from the full width of the finger screen. Alternate designs providing equal performance, such as a walking-floor type conveyor, will be considered if proposed. Chutes, skirting or guards may be used to provide an effective transition from the finger screen to the receiving conveyor while minimizing spillage. Belt shall be sprocket driven, not driven by friction between head pulley and belt. Belt shall be nominally 60 to 72 inches in width.

Receiving conveyor shall also be capable of being loaded directly by wheeled loader or similar device, from the side opposite the finger screen (see Figure ____). For this purpose, the accessible horizontal length of the conveyor shall be at least 10 feet to accommodate the wheel loader bucket and any protruding material. Conveyor shall be capable of withstanding impact from a 1.5' x 1.5' x 1.5' concrete block, weighing approximately 500 lb., from a height of 2 feet above receiving surface, and continuing to operate.

Drive motor may be electrical or hydraulic and shall be located at the head shaft. If electrical, motor shall be TEFC, installed in accordance with the National Electrical Code. Lubricants shall be added to the recommended levels in all bearings, gear motors, and other lubricated parts before motor is run. Prior to operation, motor shall be checked for proper rotation and corrected if necessary. Speed reducer, if needed, shall be AGMA class 2 shaft mounted type with oil and dust tight steel or cast iron housings.

Base of equipment shall be configured for operation on compacted soil, and with the ability to be relocated as needed. Conveyor shall have all necessary guards and safety equipment to conform to ANSI 2245 standards and other applicable occupational safety standards.

Tail pulley shall have zero speed switch capable of interlocking with finger screen controls, to shut off finger screen if zero speed event occurs.

Conveyor speed shall be continuously variable from 20 to 40 feet per minute.

Conveyor shall discharge onto Elevating Conveyor or shall be joined with Elevating Conveyor as a single unit. If the latter option is offered, Receiving/Elevating Conveyor shall be armored belt or approved equal. Regardless of option, skirting and sideboards shall be provided at transition from Receiving to Elevating sections and shall prevent spillage of materials at Design Maximum Throughput.

ELEVATING CONVEYOR COMPONENT

Elevating conveyor shall be slider-bed style inclined conveyor, sized and positioned to receive materials from the full width of the Receiving Conveyor and discharge those materials onto Sorting Platform conveyor. Chutes, skirting and/or guards shall be used to provide an effective transition from the receiving conveyor and minimize spillage. Elevating Conveyor shall be nominally 60 to 72 inches in width, and no less wide than Receiving Conveyor. Elevating Conveyor speed shall be no less than that of the Receiving Conveyor at all times.

Drive motor may be electrical or hydraulic and shall be located at the head shaft. If electrical, motor shall be TEFC, installed in accordance with the National Electrical Code. Lubricants shall be added to the recommended levels in all bearings, gear motors, and other lubricated parts before motor is run. Prior to operation, motor shall be checked for proper rotation and corrected if necessary. Speed reducer, if needed, shall be AGMA class 2 shaft mounted type with oil and dust tight steel or cast iron housings.

Base of equipment shall be configured for operation on compacted soil, and with the ability to be relocated as needed. Conveyor shall have all necessary guards and safety equipment to conform to ANSI 2245 standards and other applicable occupational safety standards.

A portion of the sideboards for the Elevating Conveyor shall be readily removable from at least one side of the inclined part of the conveyor, to enable a work platform to be positioned for manual removal of oversize objects prior to discharge. An emergency-stop / start switch and any other required safety features shall be installed at this location to provide full compliance with ANSI 2245 and **OSHA** requirements, and to enable workers to temporarily halt conveying while removing large objects.

Tail pulley shall have zero speed switch capable of interlocking with Receiving Conveyor, to shut off Receiving Conveyor if zero speed event occurs. This may incorporate a time delay relay to enable Receiving Conveyor to continue to operate during a brief shutdown of Elevating Conveyor.

SORTING PLATFORM COMPONENT

Sorting Platform shall consist of an elevated horizontal slider-bed conveyor, 72 inches in width, flanked on each side by a work area running parallel to the conveyor with at least four work stations. Work stations shall be separated by drop chutes at least 5 feet in length (parallel to the conveyor path) by 4 feet in width. Each work station shall provide at least a *3'* x 3' floor area for worker to occupy between drop chutes. Total width of each of the two work areas, from conveyor to handrail, shall be at least ***6*** feet, or as necessary to comply with code requirements. Sorting Platform shall include all handrails, stair/ladderways, emergency switches and other safety features necessary for full compliance with ANSI 2245 and **OSHA** requirements.

Sorting Platform conveyor shall be the appropriate height above Sorting Platform floor to enable workers to remove materials and drop them down chutes with a minimum of effort. Conveyor shall include skirting and side rails designed to enable workers to drag heavy objects off of conveyor and into chutes without lifting.

Except where support structures (legs) occur, clear height beneath Sorting Platform shall be at least 10 feet to facilitate placement of roll-off containers for recovered materials. Total length of Platform and positions of drop chutes shall be such that four roll-off containers, each 8.5 feet wide, may be placed side by side directly below drop chutes to receive recovered materials.

Sorting Platform shall be designed to be stable when placed on compacted soil graded to 2% slope or less. Base of equipment shall be configured for operation on compacted soil, and with the ability to be relocated as needed.

Sorting Platform shall include a canopy to protect workers from overhead sun and rainfall. Canopy may be fabric or rigid material. Roll-up fabric or detachable rigid sides are also desired, to provide additional protection from wind and windborne dust. At least **30** percent of the canopy top and side materials should be translucent or transparent, to provide adequate light. Canopy frame may be integral with Sorting Platform, attached to Sorting Platform, or free standing on Sorting Platform.

Sorting Platform conveyor drive motor may be electrical or hydraulic and shall be located at the head shaft. If electrical, motor shall be installed in accordance with the National Electrical Code. Lubricants shall be added to the recommended levels in all bearings, gear motors, and other lubricated parts before motor is run. Prior to operation, motor shall be checked for proper

rotation and corrected if necessary. Speed reducer, if needed, shall be AGMA class 2 shaft mounted type with oil and dust tight steel or cast iron housings.

Sorting Platform conveyor speed shall be variable, with a range from 30 (or less) to **80** (or more) feet per minute, with on/off/jog and speed control from at least one of the two work areas on the Sorting Platform.

Tail pulley shall have zero speed switch interlocked with Elevating Conveyor, to shut off Elevating Conveyor if zero speed event occurs.

With all components in place, the discharge end of the Sorting Platform conveyor shall extend at least ***6*** feet beyond the base of the nearest rolloff container, to facilitate the handling of discharged materials.

ELECTRICAL GENERATOR COMPONENT

Electrical Generator Component shall consist of the following Subcomponents:

Electrical Generator, Fuel Tank and Controls
Water Pump, Piping and Pump Controls

ELECTRICAL GENERATOR **AND** CONTROLS

The anticipated electrical load for finger screen, all conveyors, water pump, and control power is approximately 60 HP. It is anticipated that a generator rated for 50kW prime power can provide the necessary electrical power. In any event, the proposed generator shall be capable of providing continuous power for all components of the System, so that System is continuously operable at Design Maximum Throughput.

The proposed generator unit shall be mounted on a rigid skid or trailer suitable for quickly relocating the unit as needed. This skid may also include the generator fuel tank; the hydraulic power unit, if applicable; and the water pump for dust control.

Controls for the generator and the entire system should be mounted on, or in close proximity to, the generator skid.

Generator shall be designed to operate on #2 diesel fuel in compliance with Monterey Bay Unified Air Pollution Control District requirements.

Engine speed shall be governed by an electronic governor to maintain generator frequency within + or – 1% of rated value from no load to full load output. Engine shall be equipped with battery, starter motor and battery charging alternator.

Generator shall be capable of maintaining voltage within +or- 2% at any constant load from 0% to 100% of rating. On application of any load up to 100% of the rated load, the instantaneous voltage dip shall not exceed 20% and shall recover to within +or- 2% of the rated voltage within one second.

Generator shall be equipped with line current sensing output circuit breaker(s) to protect against overload condition.

Generator package shall also include silencer, fuel tank, cooling system, batteries, battery charger, and all accessories required for stand-alone operation. Instruments shall include voltmeter, ammeter, frequency meter, battery charging voltmeter, oil pressure gauge, coolant temperature gauge, running time meter, and voltage regulator with adjusting rheostat. Exhaust silencer and spark arrestor shall be included.

An alternate power system such as a diesel motor connected to both a generator and a hydraulic pump may be proposed. It must have capacity and reliability that is equivalent to the power supply system specified above.

WATER PUMP, PIPING **AND** PUMP CONTROLS

A pump capable of delivering 10 GPM at 80psi is expected to provide sufficient pressure and volume of water for dust control at the finger screen fines discharge. The theoretical power requirement for this delivery is approximately ½ horsepower. Taking into account line and valving losses, motor efficiencies, and the need for a factor of safety at this stage of design, a 5hp pump has been used for cost estimating purposes, configured as a single-stage in-line centrifugal pump with flooded suction. Hoses with threaded fittings shall be used to connect pump to water supply. Maximum theoretical water use, at 10 GPM, would be **4,800** gallons per day. It may be possible to provide adequate dust control with substantially less water use, but that is not known at this time. In any case, it is assumed that others will provide the water, an appropriate tank and a discharge hose suitable for connection to the pump intake. In addition to the pump and all downstream hoses and pipelines, including pressure and flow controls and connections to the Finger Screen, the proposer shall provide the necessary pump controls, including automatic shut-off in the event of water supply failure.

Attachment C

0342

05/17/01

County Of Santa Cruz
Department of Public Works
701 Ocean Street, Room 410
Santa Cruz, CA 95060

RE: Construction and Demolition Waste Recycling

Gentlemen,

Thank you for the opportunity to participate in the planning stages of your recycling program. A committee of the builders exchange board and membership met to discuss this issue and have the following input and suggestions to offer.

In general recycling has always been a hard thing for contractors to do, as it requires more time and money. As we all know the bottom line is usually the most important item for contractors or developers. This makes it difficult to sort material on site. The possibility of being able to bring mixed loads of C&D is certainly a plus, and one for which we would advocate. We believe that in order to get contractors to comply with this, the rates would have to be reduced for recyclable materials. You may also want to impose greater fees for those who do not separate the C&D waste for recycling and dispose of it as general refuse.

Another Item of concern is separating fasteners from wood waste, different types of roofing and rebar from concrete. We feel that in order for this to work nails would have to be able to be left in the lumber, and rebar in the concrete. We are aware of grinders that will handle this sort of material.

The roofing becomes a more difficult issue as you may have more than one type of roof layered on a building. In other words, you may tear off a roof that consist of wood shakes with felt paper that also has a layer of composition shingles. This is very difficult and costly to sort on site. There has to be the ability to bring this material in mixed. The other roofing such as tar and gravel can be separated more easily, however you will always get some mixed up. Clean roofing gravel should be easily recycled, and not subject to high fees as there would be little handling required on your part.

Also the outside waste contractors for the county who supply dumpsters would need to supply dumpsters for recyclable materials for those who do not haul there own waste.

We feel that adding more fees to permits would not be a fair way to regulate this, and it would be one more fee that people need to contend with in an already convoluted system.

In closing, recycling must be made user friendly. Banning certain materials from the landfill, and making it difficult to recycle without cost incentives would no doubt cause illegal dumping on the part of some people. This would not be good for anyone involved.

Once again we appreciate your time and consideration for allowing us this input. If you have any questions or would like to meet and discuss any of this, please feel free to contact The Builders Exchange.

Sincerely
Santa Cruz County Builders Exchange

COUNTY OF SANTA CRUZ

REQUEST FOR TRANSFER OR REVISION
OF BUDGET APPROPRIATIONS AND/OR FUNDS

0344

Department: PUBLIC WORKS

Date: AUGUST 29, 2001

TO: Board of Supervisors / County Administrative Officer / District Board

I hereby request your approval of the following transfer of budget appropriations and/or funds in the fiscal year ending June 30, 19____

AUDITORS USE ONLY			
DOCUMENT #	AMOUNT	L/N	T/C HASH
JE 6			

BATCH #	
DATE	Keyed By:

	T/C	INDEX	SUBOBJECT	USER CODE	AMOUNT	ACCOUNT DESCRIPTION *
TRANSFER TO	021	6251110	3590		586000.00	CSA-9C DPW SERVICES
	021	6251110	8404		575000.00	CSA-9C EQUIPMENT
	021	6251110	8409		175000.00	CSA-9C MOBILE EQUIPMENT
TRANSFER FROM	022	6251110	9695		1336000.00	CSA-9C CONTINGENCIES

Explanation: BUENA VISTA LANDFILL CONSTRUCTION *AND* DEMOLITION MATERIAL RECYCLING PROGRAM
1 STAFFING, OPERATIONS *AND* MAINTENANCE *(3590) $586,000.00*
2 SORTING LINE EQUIPMENT *(8404) $575,000.00*
3 DROP BOX CARRIER *(8409) $130,000.00*
4 (8) DROP BOXES IN VARIOUS SIZES (8409) $30,000.00
5 STAKESIDE TRAILER (8409) $15,000.00

Name CAROL D. KELLY

Title DIRECTOR OF ADMINISTRATIVE SERVICES

Auditor-Controller's **Action:** I hereby certify that unencumbered balance(s) is/are available in the appropriations/funds and in the amounts indicated above,

Auditor-Controller, by _____, Deputy Date 9/6/01

County Administrative Officer's Action: | | Recommended to Board | | Approved | | Not Recommended or Approved

County Administrative Officer _____ Date _____

State of California } ss. County of Santa Cruz}

As the Clerk of the Board of Supervisors of the County of Santa Cruz, I do hereby certify that the foregoing request for transfer was approved by said Board of Supervisors as recommended by the County Administrative Officer by an order duly entered in the minutes of said Board on

_____, 19____, By _____, Deputy Clerk

RPM:mg

(A-C)* Desc: _____ Item _____ - Budget Transfer

BRD. NAME AGENDA DATE ITEM NO.

A-C Review		

Distribution:
White-Board of Supervisors
Yellow-Auditor-Controller
Green-County Administrative Officer
Pink-Originating Department
Goldenrod-Departmental Control Copy

AUD 74 (REV 12/94)

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