Appendix I

Western Placer Waste Management Authority Correspondence Regarding Odor Mitigation Measures

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TECHNICAL REPORT #2

Date: August 2, 2019

To: Robin Baral, Churchwell White LLP

From: CE Schmidt, PhD; TR Card, PE/MS

RE: Odor Mitigation Measures Related to Proposed Development within the WRSL Buffer Zone

Scope

The purpose of this report is to:

(1) review odor analyses included as technical appendices to the Draft Environmental Impact Report for Sunset Area Plan and Placer Ranch Specific Plan (EIR);

(2) identify feasible mitigation measures that can be implemented at the Western Regional Sanitary Landfill (WRSL) to address odor impacts identified in the EIR; and

(3) Propose a multi-tiered mitigation management plan (MMP) that will achieve the desired level of odor control in phases.

The MMP proposes a multi-tiered strategy of implementation measures, additive to existing and future WRSL operations, to directly address the need for additional odor mitigation in response to proposed development within the existing 1-mile buffer zone, as proposed in the EIR.

It should be stated that it is not possible to achieve zero emissions from a materials recovery facility (MRF) operation, a compost site, and a landfill, let alone all three operations on one site. It can be possible, however to achieve acceptable odor emission levels given an adequate level of infrastructure, state of the art and sustainable waste handling and processing technologies, ongoing odor monitoring, and adherence to best management practices (BMPs) for all operations on site.

The MMP is summarized in Table 1. The components of the MMP are described below along with background information, which provide a basis for decision-making in reference to odor sources on site. Note that some options for odor control are listed in Table 1 but are not included in the cost estimates. These options show what additional work can be done to further reduce odor emissions. Upfront capital costs and annual operating costs are both summarized.

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MMP TIER	SITE ODOR CONTROL	LANDFILL	COST	MRF	COST	COMPOST OPERATIONS	COST	SITE MODs	COST	PR/CR ODOWATCH	COST	TOTAL TIER COSTS
TIER #1	80%	Odor neutralizer coating	$200K/$100K per yr a	Alter hours of operation	$300K per yr o	Positive ASP/BFL	$5,000K u	New site study	$150K hh	Enhanced Modeling	$200K oo	
		Increased screening	$200K pr yr b	Covered bins	$200K p	BMP routine training	$50K per year v	Trees on border	$500K ii	Full time staff CR	$150K per year pp	
		No LFG banking	Unknown c	No PM sorted refuse	$300K per yr q	Annual odor emission test	$100K per year w	Tall wall	$200K jj	Odor hot line	$20K per yr qq	
		Limited working face	$250K/$150K per yr d	Deodorant use on streams leaving	Under LF	Mixing building with BF	$2,000K x					
		BMP on cover material	$100K per yr e			Inoculant use; enzymes	$200K per year y					
			$450/$550 per yr		$0,000K/$000K per yr		$2,000K/$150K		$850K/NA		$200K/$170K per yr	$3,500K/$770K
TIER #2	90%	Possi Shell on cover failure	$200K f per yr	MRF negative air/scrubbing	$7,000K/$100K per yr r	Digestion of food waste	$10,000K/$400K per yr z	Improved housekeeping	$300K per yr kk	Monthly public meetings	$30K per year rr	
		Continuous covering Active Face	$300K g per yr			Control on curing	$2,500K aa	Street sweeping	$300K per year ll			
		Routine gas collection checks	$150K h per yr			Monthly odor testing	$150K per year bb					
		Improved pond aeration	$200K plus $10K i			Digestion of biosolids	$10,000/$400K per yr cc					
			$200K/$660 per yr		$0,000K/$000K per yr		$2,500K/$150K per yr		$0,000K/$000K per yr		NA/$30K per yr	$2,700K/$840K
TIER #3	95%	Improved interim cover	$1,000K per yr j	Pre-MRF sorting/sealed containers	$10,000K new MRF s	Control on stockpiles	$2,000K dd	Dispersion fans	$200K mm	Hire neighborhood watchdogs	unknown	
		Additional gas wells	$5,000k/$50K per yr k			Bagging of finish	$5,000K ee per year			24/7 off site office	$24K per yr ss	
		Covered leachate ponds	$1,000K l									
		Treatment of pond emissions	$200K/ $10K n									
			$7,200K/1,060K per yr		$10,000K/NA		$2,000K/$0,000K per yr		$200K/NA per yr		NA/$24K per yr	$9,400K/$1,284K
TIER #4	98%	Surface covers and gas collection	Unknown	Control emission from recycle	$1,000K t	Enhanced ASP/Micropore	$15,000K ff	Covering secondary sources	$100K nn	Community shareholders	$24K per yr tt	NA/$124K
					$1,000K/NA	GW blending off site	$5,000K gg		NA/$100K per yr		NA/$24K per yr	NA/$124K
							$20,000K					
			(Initial costs/annual)									$15,600/$2,918
TOTAL LF COST			$7,850K/$2,270									
TOTAL MRF COST					(Initial costs/annual) $000K/$000K							
TOTAL COMPOST COST							(Initial costs/annual) $6,500K/$300K					
TOTAL SITE MOD COST									(Initial costs/annual) $1,050K/$100K			
TOTAL PR/CR COST											(Initial costs/annual) $200K/$248K	

Note- technologies shown in gray are considerations but not included in the cost estimate

Technologies shown in green are allready planned and not included in these cost totals

a- $200K to set up spray system on outgoing lines; $100K/yr for product and maintenance
b- CARB landfill monthly screening and covering methane/odor surface repair; 12 @ $15K screenings plus data useage
c- Cost to be negotiated with LFG management company
d- Costs realted to staging truck; added employee $150K per year plus site facility $250K
e- Costs associated with additional soil cover per year
f- Cost for Possi Shell product and equipment rental
g- Continuous temporary foam on active face during filling
h- Cost for employee to conduct continuous LF gas leak checks on above ground piping well system
i- $200K for better aeration system plus $10K for additional compressor energy per year
j- $10/sq foot; estimated costs per year $1,000K
k- Unknow number of added wells; $40K per well installation plus connection; perhaps $500K per year
l- $10 per sq foot; 2 acres or $1,000 K
m- $200K for scrubber system; $10K to maintain per year (biofilter)
n- $200K cover/Membrane cover and piping to flare; $10 per sq foot as needed on areas of the landfill
o- $300K per year for more staff working faster during good dispersion and idle time during poor dispersion
p- Purchase of covered bins @ $30K each or so
q- Additional staff costs per year
r- Installation of negative air and scrubber; $250K operational costs per year (air conditioning)
s- $10,000K off site MRF; NOT included in cost estimate
t- $100 per sq ft for on site warehouse; 10,000 sq ft bldg, $1,000K (may need to be larger); NOT inlcuded in cost estimate
u- $5,000K estimate, but depends on the capacity
v- Training on BMP every 6 months
w- Compost R&D work
x- Installation of mixing building with biofilter scrubbing
y- $200k per year for inoculant use on compost pre ASP; NOT included in cost estimate
z- Installation of digesters at 10,000K with $400K operating costs per year; NOT included in cost estimate
aa- Installation of ASP aeration system
bb- $150k for full time employee to monitor odors from composting
cc- Costs for adding a digester for biosolids off site at WWT; same as the costs for digester onsite for commercial food waste stream; NOT included in cost estimate
dd- Increase the size of the mixing building to bring in all stockpile material
ee- $0.02K per ton to bag; 100k tons per year, $5,000K
ff- $15,000K for modifying ASP with the Gore micropore cover system, or enclosing the ASP; NOT included in cost estimate
gg- Costs for an off site facility; NOT included in cost estimate
hh- One time site odor study

ii- Tree cost plus planting
jj- $0.0100K per lineal foot; 2,000 feet
kk- Annual labor costs
ll- Labor costs plus a street sweeper
mm- $100K per fan on border, 2 fans
nn- Covers on secondary sources- tarps or micropore
oo- Enhanced dispersion modeling to tweak up the Odowatch system
pp- Full time staff member or CR/PR consultant
qq- Hardware/software for phone system
rr- Out of pocket costs for monthly neighborhood meetings
ss- $2K per month for office space/utilities
tt- $2K per month for meeting costs

(1) Background Reports

2015 Odor Study

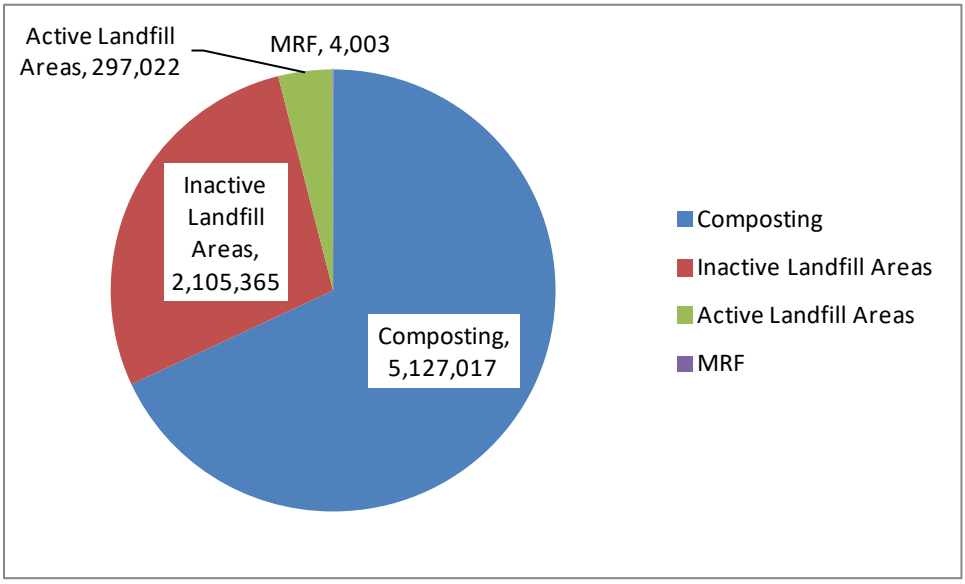
Reducing fugitive odor emissions from the site, in an attempt to reduce off site odor impacts with a limited border zone, includes both physical and operational changes in the current facilities on site including the MRF, the landfill (landfilling of solid waste, gas collection system, energy conversion operation), and green waste/food waste composting operation.

A robust odor emission source apportionment study was conducted at the site in August of 2015 and reported to WPWMA October 2015. The MRF, the active and inactive areas of the landfill, and the compost operations were studied, and in total 97 measurements were performed. The results of the study are shown in Figure 2.

The units shown in the pie chart are 'odor emissions'. On a percentage basis, the odor emissions from the MRF represent 0.053% of site odor emissions, then active face of the landfill 3.9%, the inactive landfill 28%, and the compost operations 68%. This odor emission apportionment data is useful in prioritizing odor reduction technologies and activities for cost-effective odor control.

These data can be used to model emissions from the site but, more importantly for this study, they show where the odor from the site comes from and can also serve as the bases for estimating future emissions as remedial measures for odor control are applied to these site operations.

Figure 2. Relative Odor Emissions by Landfill Process



SCS 2018 Odor Analysis

In addition to the 2015 odor study report, SCS produced a report dated September 27, 2018 entitled **Evaluation of Incremental Odor Increase from Western Regional Sanitary Landfill**. Table 2 shows the conclusions from that document as to the projected increase in odor emissions. This table shows that, without further odor controls (indicated as business as usual), the odor will increase by a factor of 1.97. The increase from Placer Ranch alone will be 15% of this increase.

Table 2. Projected Increase in Landfill Odor Emission Rates.

Source	2015 Odor Emission Rate (DT/min)	2058 BAU Odor Emission Rate (DT/min)	Incremental Project Odor Emission Rate (DT/min)
LFG	2,105,365	4,989,009	319,335
Composting	5,158,143	9,356,955	805,321
Active Face	214,150	388,472	33,434
MRF	4,003	7,262	624
Total	7,481,661	14,741,697	1,158,716

Also in this report, impacts from these increases were modeled with the results shown below in Table 3. This table shows the number of anticipated exceedances for three odor thresholds (10, 8 and 5 dilutions to threshold) at various neighborhood locations. The reduced source strengths that will be achieved by implementing the mitigation measures described below will reduce these impacts, but the exact reduction will not be known until the revised source strengths are evaluated using an atmospheric dispersion model. However, most of the time, a reduction of the odor source will result in a proportionate reduction in impacts described in Table 3, below.

Table 3. Modeled Future Odor Impacts.

Location	Upscaled Impact in 2058			Upscaled Impact Minus Project			Increase in Exceedance from Project		
	10 DT	8 DT	5 DT	10 DT	8 DT	5 DT	10 DT	8 DT	5 DT
WRSL parking lot	434	566	1059	375	505	938	59	61	121
Closest regional commercial	73	102	178	59	93	164	14	9	14
Mid North boundary of future Sac State	14	40	113	9	28	96	5	12	17
Roundabout at entry to future Sac State	1	7	13	0	3	9	1	4	4
Closest medium density residential	1	1	9	0	1	7	1	0	2
Closest low density residential	0	1	7	0	0	6	0	1	1
William Hughes Park	0	0	5	0	0	4	0	0	1
Leopard Davis Park	0	0	5	0	0	3	0	0	2
Verrasona and Vignolia	0	0	5	0	0	4	0	0	1
Closest high density residential	0	1	4	0	0	4	0	1	0
Greywood Circle	0	0	4	0	0	3	0	0	1
Woodcreek Oaks Safeway	0	0	3	0	0	3	0	0	0
Rainbow Trout	0	0	2	0	0	2	0	0	0
Veterans Park	0	0	2	0	0	2	0	0	0
Settlers Ridge	0	0	2	0	0	2	0	0	0
Dugan Park	0	0	2	0	0	2	0	0	0
Amoruso	0	0	2	0	0	2	0	0	0
Fiddyment Farm Elementary	0	0	2	0	0	2	0	0	0
Mel Hamel Park	0	0	2	0	0	1	0	0	1

(2) Mitigation Measures

Real-Time Odor Monitoring

In order for this program to be successful, WPWMA and the community need to develop an effective odor monitoring program that is able to distinguish casual odors from nuisance odors, and to pinpoint odors emanating from the WRSL or from other sources. There have been several successful approaches to accomplish this, but all rely on an odor intensity and duration quantification strategy. An odor does not reach nuisance status until certain time dependent intensities and frequency of odor episodes are exceeded. Long duration intense odors are considered nuisances where short duration less intense odors that only occasionally occur are not.

Monitoring of odors in real time, through the location of sensors on site and in areas proximate to the WRSL, will greatly assist in addressing odor issues as they arise in the future.

Landfill Operations

Reducing the fugitive emissions from the landfill would focus on three components of the operation: active landfill face, landfill gas collection system, and the waste gas-to-energy plant operations. The active face of the landfill operation has a high flux of odor but a limited surface area and as such, accounts for about 4% of the site odor emissions. This active dumping and filling area is difficult to control, and an Odor Control Handbook operating procedure has been prepared (September 2017). Controlling emissions from the active face of the landfill operations would require the limiting or elimination of very odorous materials such as biosolids from wastewater facilities, limiting the working face surface area, the use of interim cover materials or foam products during the day, and complete coverage of refuse overnight. Although this surface area is generally small by comparison to the area of the landfill, controlling fugitive emissions from the active face will limit the release of fugitive odor release from a significant odor source.

The greater concern is the landfill gas collection system on the inactive portions of the landfill, which accounts for 28% of the site odor emissions. Landfill gas collection must operate within design specifications. This includes using the required landfill monitoring data to insure the proper operation and placement of landfill gas wells (adding wells where needed), and the collection of landfill gas from the wells. The landfill gas cannot be ‘banked’ or stored in the landfill, but rather used, flared, and/or stored in a leak free container so that the surface of the landfill has minimum fugitive emissions and maintained under design negative pressure. This requires operating the landfill gas collection system at maximum containment and not necessarily the most cost-effective performance of the gas-to-energy operation. Landfill gas not used for energy production must be flared and/or stored in a proper container, rather than stored in the landfill, which may reduce the efficiency or operation of the gas-to-energy plant.

Landfill cover integrity can be verified using the CARB methane survey protocol. The frequency of verification and repair will depend on the level of odor control desired. Cover integrity problems (showing over 25 ppmv of methane) can be repaired either using the normal cover material, or a more high performance technology like Posi-shell or polymer membrane.

The options for odor control include:

Tier 1 (target 80% control)

- Using an odor neutralizer coating on sorted refuse from the MRF,
- Increased screening of piping and well casings,
- No landfill gas banking (flare gas not used maintaining acceptable gas collection,
- Limiting the size of the active face, and
- Best management practice employed at the active face.

Tier 2 (target 90% control)

- Posi-shell or membrane used as interim cover as opposed to soil,
- Use of suppressing foams continuously at the active face during land filling,
- Routine and frequent gas well inspection, vacuum checks, and screening, and
- Improved leachate pond aeration.

Tier 3 (target 95% control)

- Improved interim cover
- Additional gas wells
- Covered leachate ponds
- Treatment of pond emissions

The actual effectiveness of these measures is presented in Table 4. The combined control strategies (Tiers 1 through 3) are anticipated to offer a 90% reduction of landfill emissions, resulting in an overall reduction of 28% in total site emissions. However, since odor emissions are anticipated to increase by a factor of 1.97 (2015 Baseline to 2058) the reduction will result in a 14% reduction in 2058 over the 2015 baseline.

Table 4. Estimated Actual Effectiveness of Landfill Odor Control Measures.

MMP TIER	SITE ODOR CONTROL	LANDFILL	COST	Source Portion	Relative Effectiveness
LANDFILL				32% of Total	
TIER #1	80%	Odor neutralizer coating	$200K/$100K per yr a		Estimated 10% Reduction, 3% overall
		Increased screening	$200K pr yr b		Improves certainty of performance
		No LFG banking	Unknown c		Estimated 20% Reduction, 6% overall
		Limited working face	$250K/$150K per yr d		Estimated 10% Reduction, 3% overall
		BMP on cover material	$100K per yr e		Estimated 10% Reduction, 3% overall
			$450/$550 per yr		Estimated 50% Reduction, 16% overall
TIER #2	90%	Possi Shell on cover failure	$200K f per yr		Estimated 5% Reduction, 2% overall
		Continuous covering Active Face	$300K g per yr		Estimated 5% Reduction, 2% overall
		Routine gas collection checks	$150K h per yr		Estimated 5% Reduction, 2% overall
		Improved pond aeration	$200K plus $10K i		Estimated 5% Reduction, 2% overall
			$200K/$660 per yr		Estimated 20% Reduction, 6% overall
TIER #3	95%	Improved interim cover	$1,000K per yr j		Estimated 5% Reduction, 2% overall
		Additional gas wells	$5,000k/$50K per yr k		Estimated 5% Reduction, 2% overall
		Covered leachate ponds	$1,000K l		Estimated 5% Reduction, 2% overall
		Treatment of pond emissions	$200K/ $10K n		Estimated 5% Reduction, 2% overall
			$7,200K/1,060K per yr		Estimated 20% Reduction, 6% overall
TIER #4	98%	Surface covers and gas collection	Unknown		

Note- technologies shown in gray are considerations but not included in the cost estimate

a- $200K to set up spray system on outgoing lines; $100K/yr for product and maintenance

b- CARB landfill monthly screening and covering methane/odor surface repair; 12 @ $40K screenings plus data useage

c- Cost to be negotiated with LFG management company

d- Costs realted to staging truck; added employee $150K per year plus site facility $250K

e- Costs associated with additional soil cover per year

f- Cost for Possi Shell product and equipment rental

g- Continuous temporary foam on active face during filling

h- Cost for employee to conduct continuous LF gas leak checks on above ground piping well system

i- $200K for better aeration system plus $10K for additional compressor energy per year

j- $10/sq foot; estimated costs per year $1,000K

k- Unknow number of added wells; $40K per well installation plus connection; perhaps $500K per year

l- $10 per sq foot; 2 acres or $1,000 K

m- $200K for scrubber system; $10K to maintain per year (biofilter)

n- $200K cover/Membrane cover and piping to flare; $10 per sq foot as needed on areas of the landfill

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MRF Operations

Controlling odor emissions from the MRF is challenging given that the operation is a transfer and sorting operation. The considerations for reducing MRF odor emissions include:

Tier 1 (target 80% control)

- Minimizing the daylight hour amount of waste processed, and eliminating the storage of unprocessed incoming waste overnight;
- Controlling the surface area of sorted material waiting for landfilling using agents such as foam products, and
- No evening refuse sorting

Tier 2 (target 90% control)

- Collecting and treating fugitive air emissions in the MRF building using filtration.

Tier 3 and Tier 4 options (up to 98% control) include constructing and operating an off-site MRF facility, and processing digestor wastes.

The controlling of municipal waste incoming could be achieved by organizing collection and transfer activities, which may only be achieved by using an off-site parking area remote from the facility. Refuse transfer could be better managed operationally but not without developing an improved operational process. The goal would be to only receive refuse that can be processed within a working day, and have no unprocessed refuse for overnight storage. Housekeeping of transfer decks at the end of the day would also be necessary. The use of storage bins with covers or lids for segregated or processed refuse, and landfilling of stored materials by the end of the day would reduce odor emissions from the facility. The goal is limiting the surface area of odorous materials. Lastly, putting the MRF building under negative air and scrubbing the building air would be challenging and expensive, however collecting fugitive emissions from selected work stations with independent collection and treatment systems could be feasible. Another option is using odor masking/sorbent sprays on refuse as sorted or in storage waiting processing and landfilling. The use of masking agents typically has limited success, however this technology can be used when other approaches are not satisfactory.

Table 5 presents a summary of the anticipated effectiveness of these measures. These measures are anticipated to have a 40% reduction in MRF odors resulting in less than 1% reduction in total site odor.

Given the challenge of controlling emissions from the MRF and cost, and given that the MRF accounts for less than 1% of the site odor emissions, extensive changes to MRF operations may not be warranted on a cost-benefit basis. Since MRF operations entail low odor emissions, Tier 1-4 MRF implementations were not included in the cost estimates in the MMP.

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Table 5. Estimated Actual Effectiveness of MRF Odor Control Measures.

MMP TIER	SITE ODOR CONTROL	MRF	COST	Source Portion	Relative Effectiveness
MRF				<1% of Total	
TIER #1	80%	Alter hours of operation	$300K per yr o		Estimated 10% Reduction, >1% overall
		Covered bins	$200K p		Estimated 10% Reduction, >1% overall
		No PM sorted refuse	$300K per yr q		Estimated 10% Reduction, >1% overall
		Deodorant use on streams leaving	Under LF		Estimated 10% Reduction, >1% overall
					Estimated 40% Reduction, >1% overall
			$0,000K/$000K per yr		
TIER #2	90%	MRF negative air/scrubbing	$7,000K/$100K per yr r		Estimated 50% Reduction, >1% overall
			$0,000K/$000K per yr		
TIER #3	95%	Pre-MRF sorting/sealed container	$10,000K new MRF s		
			$10,000K/NA		
TIER #4	98%	Control emission from recycle	$1,000K t		
			$1,000K/NA		

Note- technologies shown in gray are considerations but not included in the cost estimate

o- $300K per year for more staff working faster during good dispersion and idle time during poor dispersion

p- Purchase of covered bins @ $30K each or so

q- Additional staff costs per year

r- Installation of negative air and scrubber; $250K operational costs per year (air conditioning)

s- $10,000K off site MRF; NOT included in cost estimate

t- $100 per sq ft for on site warehouse; 10,000 sq ft bldg, $1,000K (may need to be larger); NOT inlcuded in cost estimate

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Compost Operations

The odor emissions from the current windrow composting operation is the largest odor source on site and accounts for about 68% of the site odor emissions. Odor emissions from the compost operations can be significantly reduced by as much as 90% of that assessment figure according to a pilot-scale test conducted on site (December 2016) by installing an positive air, aerated static pile (ASP) technology that uses a covered, forced-air composting technology. The compost blend is placed in a three-sided block wall structure where the process days for the life-cycle operation of the composting process is contained. One day of process compost is placed with consecutive days joining until the facility is full. Compost and cover placement is accessed from the open side of the wall enclosure. The piles are not moved until maturation thus the 'static' nomenclature. Similarly, process air or aeration is added to the bottom of the compost or 'zones' of compost in the matrix as the piles or zones are aerated and static until composting is complete. The final design component is a layer of finish compost or 'biolayer' on the composting material which is the air emission 'control device'. The cover layer is maintained by irrigation water and when the matrix is complete the ASP is one continuous pile with zones joined on the sides as the material is added and taken from the matrix.

Positive aeration ASP with biofilter layer can, if maintained and operated according to design specifications, achieve 90% reduction in odor emissions compared to background (windrow) compost odor emissions or greater for the compost cycle, which is the greater source of odor emissions in the composting cycle. After the composting of waste is complete, the composted materials are taken to a curing stage either before or after screening which is the step where finish compost is recovered for use as biolayer or sold as product. Typically, no odor controls are needed for the curing piles and finish compost, however some of these controls are included in the MMP as later tier options. Note that minimizing green waste/food waste coming into the site so that stockpiles are not left overnight minimizes odor emissions from the 'front end' of the process. If odor emissions are significant, there are technologies that can be employed to reduce emissions from these sources as well.

Sites that have either converted over to positive ASP with a biofilter layer have the option of installing permanent facilities (blowers with asphalt pads with in-ground aeration system and leachate system), or more temporary, above-ground facilities that employ skid mounted blowers and temporary perforated piping and leachate drainage.

Further Odor Control on Composting

Food waste is increasingly being diverted from the landfill disposal process stream. In California, the alternate disposal process is normally composting. However, composting with food waste, even in relatively small proportions, can have a significant impact on the generation of odors that can be detected off-site. The land uses proposed by the Placer Ranch Specific Plan would contribute appreciably to new food waste composting and the related odor profile.

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Therefore it is recommended that alternate food waste management strategies, e.g. anerobic digestion, be considered for food waste management. Even this approach will have a solid residual stream that needs to be composted. Given that, here is a list of approaches to further manage composting odors:

1. Receive and mix compost materials inside a structure with the ventilation air routed to a biofilter
2. Cover curing piles with finished product
3. Cure composted material using forced aeration
4. Install a mixing building with gas collection and scrubbing

Even with these management strategies, food waste management may become problematic for the site.

The proposed options included in the cost estimate for the composting operations are listed below:

Tier 1 (target 80% control)

- Positive ASP technology with biofilter (finish compost) cover for the composting phase,
- Routine Best Management Practice training,
- Annual compost odor emission testing, and
- Mixing building with gas collection and scrubbing.

Tier 2 (target 90% control)

- Convert the curing phase to positive air ASP with biofilter (finish compost) cover, and
- Monthly odor screening on site.

Tier 3 (target 95% control)

- Control on stockpiles

Tier 4 options are listed but are not costed.

Table 6 shows the anticipated actual effectiveness of these alternatives. The already planned transition from windrow composting to ASP composting will result in a 80% odor reduction from composting, resulting in an overall site reduction of 54%. Since this alternative is in the planning process, it is not included in theses costs. The further odor reduction measures will result in an additional 90% odor reduction providing for an additional total site odor reduction of 12%. Based on the anticipated growth of the landfill operations, this 12% reduction will comprise a 6% reduction in 2058, as compared to the 2015 baseline.

Table 6. Estimated Actual Effectiveness of Compost Odor Control Measures.

MMP TIER	SITE ODOR CONTROL	COMPOST OPERATIONS	COST	Source Portion	Relative Effectiveness
COMPOSTING				68% of Total	
TIER #1	80%	Positive ASP/BFL	$5,000K u		54% reduction in site odor (80% control)
		BMP routine training	$50K per year v		Improves certainty of obtaining lowest odor rate
		Annual odor emission test	$100K per year w		Improves certainty of obtaining lowest odor rate
		Mixing building with BF	$2,000K x		No data
		Inoculant use; enzymes	$200K per year y		
			$2,000K/$150K		
TIER #2	90%	Digestion of food waste	$10,000K/$400K per yr z		
		Control on curing	$2,500K aa		Estimated to be an additional 80% reduction, 10% overall
		Monthly odor testing	$150K per year bb		
		Digestion of biosolids	$10,000/$400K per yr cc		
			$2,500K/$150K per yr		
TIER #3	95%	Control on stockpiles	$2,000K dd		Estimated to be an additional 10% reduction, 2% overall
		Bagging of finish	$5,000K ee per year		No data
			$2,000K/$0,000K per yr		
TIER #4	98%	Enhanced ASP/Micropore	$15,000K ff		
		GW blending off site	$5,000K gg		
			$20,000K		

Note- technologies shown in gray are considerations but not included in the cost estimate
Technologies shown in green are allready planned and not included in these cost totals

u- $5,000K estimate, but depends on the capacity
v- Training on BMP every 6 months
w- Compost R&D work
x- Installation of mixing building with biofilter scrubbing
y- $200k per year for inoculant use on compost pre ASP; NOT included in cost estimate
z- Installation of digesters at 10,000K with $400K operating costs per year; NOT included in cost estimate
aa- Installation of ASP aeration system
bb- $150k for full time employee to monitor odors from composting
cc- Costs for adding a digester for biosolids off site at WWT; same as the costs for digester onsite for commercial food waste stream; NOT included in cost estimate
dd- Increase the size of the mixing building to bring in all stockpile material
ee- $0.02K per ton to bag; 100k tons per year, $5,000K
ff- $15,000K for modifying ASP with the Gore micropore cover system, or enclosing the ASP; NOT included in cost estimate
gg- Costs for an off site facility; NOT included in cost estimate

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Site-Wide Technologies, Predictive Technologies, and Community Relations Functions

A current, site-wide odor emission assessment is recommended serving the same purpose as the study conducted and reported in 2015. An odor source apportionment that reflects the site current operations and odor sources is vial with regard to implementing a multi-tiered MMP.

Site odor neutralizing agents can be nebulized on the site fence line, which does have some effect on reducing offsite odor, so long as the agent odor is not offensive. Typically these systems are installed and liquid material is applied directly on odor sources, but they can also be applied airborne on the fence line as ambient air 'neutralizing agents'. This technology has been evaluated on this site with limited, but quantifiable success, achieving a temporary 50% odor reduction for applying various agents to waste materials. Application of odor reducing agents can be applied to refuse at the MFR operation sorted and transported to the landfill active face, or at different stages of the sorting and storing process, and the landfill active face.

Site fence line visual blocks and fence line wind break tree-lines should be considered. These not only add favorable odors (conifers in particular) from the site but also create surface roughness which aids in plume mixing and dispersion of plumes off site. Orchard fans can also be used to further increase dispersion, especially during atmospheric dispersion condition, calm conditions, or site activity that prompts additional odor control.

An onsite monitoring effort could be established and used to inspect and remediate odors that may create off site odor impacts. Employee training programs and training in odor assessment could prove useful in minimizing site odors. Monitoring technology is available that can be used for this purpose.

The site currently has odor sensors and near real-time dispersion modeling capabilities. This system can be enhanced to further provide for the determination of off site odors as related to the site.

Several outreach programs could be used to minimize the concerns of the community in respect to off-site odor. These types of programs have been instituted and used effectively, however they require consistent support by the facility. Often times these tasks can be more cost-effectively maintained by subcontract services.

The options for site modifications and increased outreach functions by tier are provided below:

Tier 1 (target 80% control)

- Current site odor apportionment study,
- Site border trees and wall where appropriate,
- Enhanced modeling capability, and
- Full time community relations person and odor hotline.

Tier 2 (target 90% control)

- Improved site housekeeping and pavement sweeping by street sweeper (not costed due to low benefit yield), and
- Monthly public meetings.

Tier 3 (target 95% control)

- Dispersions fans, and
- Neighbors employed as odor detectives and manned offsite office.

Tier 4 (target 98% control)

- Covering secondary sources with tarps or spray/foam/Possi shell products, and
- Start a community shareholders group to oversee site activities.

Tables 7 and 8 show the anticipated impacts of these measures. These measures do not have sufficient data to provide quantifiable impacts, however they do offer an increase in certainty in meeting odor reduction targets.

Table 7. Estimated Actual Effectiveness of Site Wide Odor Control Measures.

MMP TIER	SITE ODOR CONTROL	SITE MODs	COST	Source Portion	Relative Effectiveness
SITE MODIFICATIONS				No Data	
TIER #1	80%	New site study	$150K hh		Improves certainty of obtaining lowest odor rate
		Trees on border	$500K ii		Improves certainty of obtaining lowest odor rate
		Tall wall	$200K jj		Improves certainty of obtaining lowest odor rate
			$850K/NA		
TIER #2	90%	Improved housekeeping	$300K per yr kk		Improves certainty of obtaining lowest odor rate
		Street sweeping	$300K per year ll		Improves certainty of obtaining lowest odor rate
			$0,000K/$000K per yr		
TIER #3	95%	Dispersion fans	$200K mm		Improves certainty of obtaining lowest odor rate
			$200K/NA per yr		
TIER #4	98%	Covering secondary sources	$100K nn		Improves certainty of obtaining lowest odor rate
			NA/$100K per yr		

Note- technologies shown in gray are considerations but not included in the cost estimate

hh- One time site odor study
ii- Tree cost plus planting
jj- $0.0100K per lineal foot; 2,000 feet
kk- Annual labor costs
ll- Labor costs plus a street sweeper
mm- $100K per fan on border, 2 fans
nn- Covers on secondary sources- tarps or micropore

Table 8. Estimated Actual Effectiveness of Predictive and Public Relations Odor Control Measures.

MMP TIER	SITE ODOR CONTROL	PR/CR ODOWATCH	COST	Source Portion	Relative Effectiveness
PR/CR Odowatch				No Data	
TIER #1	80%	Enhanced Modeling	$200K oo		Improves certainty of obtaining lowest odor rate
		Full time staff CR	$150K per year pp		Improves certainty of obtaining lowest odor rate
		Odor hot line	$20K per yr qq		Improves certainty of obtaining lowest odor rate
			$200K/$248K per yr		
TIER #2	90%	Monthly public meetings	$30K per year rr		Improves certainty of obtaining lowest odor rate
			NA/$30K per yr		
TIER #3	95%	Hire neighborhood watchdogs	unknown		Improves certainty of obtaining lowest odor rate
		24/7 off site office	$24K per yr ss		Improves certainty of obtaining lowest odor rate
			NA/$24K per yr		
TIER #4	98%	Community shareholders	$24K per yr tt		Improves certainty of obtaining lowest odor rate
			NA/$24K per yr		

Note- technologies shown in gray are considerations but not included in the cost estimate

oo- Enhanced dispersion modeling to tweak up the Odowatch system
pp- Full time staff member or CR/PR consultant
qq- Hardware/software for phone system
rr- Out of pocket costs for monthly neighborhood meetings
ss- $2K per month for office space/utilities
tt- $2K per month for meeting costs

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Site Future Planning- Options A and B; Landfill Waste Excavation and Reburial in New Cells

Limited information is available regarding future site planning. It would appear that the outline of site remedial activities would provide effective odor control of these two options with one exception. One of the possible future site management strategies is to move interred waste to new cells. If this is found to be necessary, the excavation site and transport needs to have odor control, most likely temporary foam application. In addition, the relocation activity may be dependent on favorable atmospheric conditions. These odor control measures will likely add about 20% to the cost of waste relocation. The excavation and re-disposal of landfill waste has not been costed or added to Table 1.

Recommendations

Based on the study data provided from the site source apportionment (October 2015) and subsequent odor mitigation studies (December 2016, August 2017) along with a projection of attainable odor control where test data are not available, the predictions below are provided to estimate the effectiveness of the MMP in reducing site odor emissions. These estimates can be verified by performing dispersion modeling using the proposed (post-mitigation) odor emission estimate (1,581,892 DT/min). Potential odor impacts related to development within the reduced buffer zone can be estimated using the post-mitigation estimate of odor emissions. Over time, ongoing monitoring can be used to confirm effectiveness of the MMP.

Minimum odor impacts (as defined by less frequent odor episodes of shorter duration and lower odor concentration) can be achieved relative to development within the proposed buffer zone, provided that effective odor reduction mitigation strategies are implemented and maintained on the site achieving an odor emission reduction of around 80%.

Table 2. Future Projected Odor Reductions (Tier 1 only)

Site Source	Current Odor Emissions (DT/min)	Percent Reduction (%)	Revised Odor Emissions (DT/min)	Reduction in Site Odor Emissions (%)
MRF	4,003	(50%)	2,002	
Active Landfill	297,002	50%	14,501	
Inactive Landfill	2,105,365	(50%)	1,052,683	
Composting	5,127,057	90%	51,271	
TOTAL ODOR	7,564,533		1,581,892	79%

Notes:

1. Percent reduction in parenthesis is estimated.
2. Estimated percent control for the MRF is based on best management practice and use of control agents and technology.
3. Estimated percent control for the inactive landfill is based on improved landfill gas collection and use or destruction.

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REFERENCES

1) TR Card and CE Schmidt, Odor Assessment Report. Prepared for WPWMA, Roseville, CA, August 2015.

2) TR Card and CE Schmidt, Draft Landfill Active Face Odor Management Handbook. Prepared for WPWMA, Roseville, CA, September 2017.

3) TR Card and CE Schmidt, Technical Memorandum, Positive ASP with Biofilter Layer Odor Assessment. Prepared for WPWMA, Roseville, CA, December 2016.

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August 22, 2019

VIA EMAIL (CCook@placer.ca.gov)

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Re: Odor Mitigation – Sunset Area Plan/Placer Ranch Specific Plan EIR
(State Clearinghouse No. 2016112012)

Dear Clayton:

On behalf of Western Placer Waste Management Authority (the "Authority") this letter sets forth the Authority's proposed odor mitigation measures for the Sunset Area Plan/Placer Ranch Specific Plan Draft EIR (the "Draft EIR"), which are based on the "MMP" presented in Technical Report #2, prepared by CE Schmidt and TR Card on August 2, 2019 ("Technical Report #2").

Technical Report #2 prioritized the MMP into four implementation tiers, according to the overall effectiveness of each measure at odor reduction. Technical Report #2 also estimated the implementation costs for each measure. As expected, implementation costs increased with each tier or incremental reduction in odor emissions.

Authority staff, working with CE Schmidt and TR Card, have examined the MMP and determined that the Tier 1 and 2 mitigation measures, as summarized below and in Attachment 1 ("Mitigation Measures"), are needed to effectively address impacts caused by residential or other development within the existing, one-mile buffer.

As noted in our previous correspondence, the Placer County General Plan currently requires all development within the Sunset Area Plan to permanently conserve land within the existing one-mile buffer. A rough calculation of the total buffer area is 3,900 acres. Reducing the buffer under the proposed General Plan amendment will open as much as 3,500 acres to new development, or approximately 1,300 acres within Placer Ranch Specific Plan, while eliminating costs for permanently conserving that area.

Removing the conservation requirement, plus allowing residential and commercial development within the existing one-mile buffer, will result in odor impacts caused by placing new, residential and mixed-use communities directly adjacent to the WRSL site.

The odor studies in the Draft EIR have also identified direct odor impacts due to the project contributing approximately 16% of all solid waste disposal at the WRSL site at buildout, and where that increase, by itself, will result in noticeable odors at key points in the Placer Ranch Specific Plan. CEQA therefore requires Placer County to adopt mitigation measures, where feasible, to reduce those odor impacts.

The most effective way to reduce odor emissions throughout the Placer Ranch Specific Plan and Sunset Area Plan is to implement odor mitigation onsite at the WRSL. In addition, mitigation measures must reduce odor emissions beyond existing levels, in order to justify any proposed reduction in the one-mile buffer.

Authority staff and its consultant team are confident that proper implementation of Tier 1 and 2 Mitigation Measures can reduce all odor emissions at the WRSL site by up to 90%. This level of reduction is needed for Placer County to justify the proposed reduction of the buffer distance by up to 90%, i.e., by reducing the buffer from one mile to 500 feet, for certain land uses. A 90% control is achievable due to the cumulative benefit in implementing the Mitigation Measures as a complete set. In other words, each Mitigation Measure, when combined, will result in a greater level of odor reduction than for each measure if they were independently implemented.

The Authority does not propose implementation of Tier 3 and 4 mitigation measures from the MMP, as they provide marginal benefit and carry significant implementation costs. In addition, the Authority does not propose many of the mitigation measures related to the MRF from the MMP, as they are not cost-effective and MRF contributions to overall odor emissions are relatively insignificant.

Tier 1 Mitigation Measures:

Tier 1 Mitigation Measures focus on landfill gas, composting, and active landfill face filling. The proposed Tier 1 Mitigation Measures are estimated to produce a combined reduction in odor emissions of approximately 70%, compared to the existing baseline. Applying the adjustment factor of 1.97 from the 2058 future estimate in the SCS report, Tier 1 Mitigation Measures will reduce projected odors by 35% for the WRSL site overall.

A. Compost Operations

(1) ASP/Compost Best Management Practices

Technical Report #2 discusses positive-aerated static piles ("ASP"), and ASP's potential to provide the most odor reduction at the WRSL site. Although ASP was shown for discussion purposes in the MMP, the Authority is not proposing ASP as a Mitigation Measure for the Draft EIR because the Authority is already planning to implement ASP, therefore implementation of ASP is not directly required due to the encroaching development of the Placer Ranch Specific Plan.

When optimized, odor reductions through ASP can reach up to 80% odor control compared to current windrow composting. In implementing ASP, however, detailed Best Management Practices (BMPs) will be needed, with programming for BMP implementation every six months, to ensure that the desired level of odor reduction is in fact achieved. Although the transition to ASP is currently in progress, BMPs are an additive measure that will be required to ensure that the maximum odor reductions from compost operations are realized, to reduce impacts directly caused by Placer Ranch Specific Plan encroaching within the existing landfill buffer, along with the significant contribution of solid waste by the project as a whole. In the absence of the Placer Ranch Specific Plan, less rigorous odor management BMPs would be needed.

Implementation of compost BMPs are estimated to result in annual operational costs of $100,000, based on approximately 1,000 additional annual work hours for the Authority's MRF and composting operator.

(2) Annual Odor Emission Test

Annual odor emission testing is needed to complement BMPs and to ensure that the Authority is achieving maximal odor reduction throughout the buildout of the Placer Ranch Specific Plan. Annual odor emission testing is estimated to cost $100,000 annually, based on the costs from the odor assessment completed by CE Schmidt and TR Card, such as manhours, travel, equipment rental, supplies, laboratory analysis, and reporting.

(3) Mixing Building with Biofilter Scrubbing

As noted in Technical Report #2, composting with food waste, even in relatively small proportions, can have a significant impact in generating offensive odors. The residential and other land uses proposed by the Placer Ranch Specific Plan will contribute significant new amounts of food waste; such contributions will be further exacerbated by locating new housing and other occupancy-based land uses closer to the WRSL site, within the existing buffer.

Installation of a mixing building, with ventilation air routed to a biofilter for scrubbing, will provide a cost-effective method for reducing odors due to food waste composting, relative to other measures. The mixing building will be a relatively small structure where food waste is received and initially blended with shredded green waste. Once blended, the material will be transferred from the building into the ASP system where it will undergo controlled composting. This measure does not entail indoor composting of all food waste, which would be prohibitively expensive.

Costs for installing a new mixing building are estimated to be $2,000,000, as opposed to complete covering of all composting, enhanced ASP, offsite mixing or anaerobic

digestion, as implementation costs for each one of these measures are in the range of $5,000,000 to $15,000,000.

Based on the above, total costs for Tier 1 Compost Mitigation Measures are estimated at $2,000,000 for capital facilities, with $200,000 in annual operational costs. These measures are needed to ensure an approximately 80% reduction in compost-related odor, which will result in an overall odor reduction of approximately 54% at the WRSL site compared to the existing baseline, or a 27% reduction compared to the 2058 future estimate.

B. Landfill Operations

Technical Report #2 identifies two major components of landfill-related odor emissions: (1) the active, working face of landfill operations, and (2) gas emissions resulting from the inactive areas of the landfill.

Landfill Active Face Mitigation Measures

(1) Odor Neutralizer

Odor neutralizers will be applied to sorted refuse between transfer from the MRF to the landfill site. Odor neutralizers will reduce landfill-related odors by 10% to 50%. Neutralizers are estimated to cost $200,000 for the initial spray system plus $120,000 annually for operational and maintenance costs, assuming a total of 200 work hours for the Authority's landfill operator ($20,000), and approximately $100,000 for neutralizer product. Installation of an odor neutralizer at the MRF prior to fill operations will reduce odor from active landfill operations by approximately 10%.

(2) Adjustments to the Landfill Working Face

Odor emissions from the active face of the landfill can be reduced by expanding the use of odor neutralizers on the landfill face, and implementation of additional landfill BMPs, such as limiting the size of the active landfill face. For odor neutralizers, as above, the MRF operator will apply foam or other products on the active landfill face during fill operations.

The use of odor neutralizers, implementation of additional landfill BMPs can reduce odor emissions from active fill operations by approximately 20%. Costs for the odor neutralizer are estimated to be similar to the above, with $200,000 for the initial system plus $120,000 annually for operation and maintenance of the spray system and neutralizer product. Additional BMPs are estimated to cost an additional $100,000 in annual costs, assuming an additional 1,000 annual work hours for the Authority's landfill operator.

Inactive Landfill/Gas Collection Mitigation Measures:

(1) Increased Screening

Fugitive landfill gas screening, according to the California Air Resource Board requirement for quarterly inspection, is intended to identify 'hot spots' of landfill gas emissions though interim and final landfill covers. Once detected, the cover is repaired, which reduces landfill gas emissions. Increasing the frequency of landfill surface screening will limit or reduce the time between the identification and repair of surface hot spot emissions, and thus odor. Additional screening can also be used to help optimize adjustment of the well field or indicate where additional wells may need to be installed. Improved odor control will be achieved by increasing the frequency of screening to a monthly schedule.

Screening will also apply to the landfill surface, gas piping and well casings, to reduce fugitive emissions from gas collection. Increasing screening to a monthly schedule will require an additional 8 screening events in addition to the quarterly schedule and is estimated to result in $200,000 in additional operational costs, assuming costs of $25,000 per screening event (labor and equipment costs combined).

(2) Enhanced Landfill Gas Collection

The Authority can establish stricter protocols to enhance landfill gas collection. Enhanced collection, however, will increase operational cost and risk. Enhanced gas collection will require significant management oversight to prevent negative impacts, such as increasing oxygen levels in the gas mixture, which increases combustion risk and therefore could significantly decrease the overall marketability of the landfill gas. Enhanced collection could therefore reduce the Authority's royalties in the range of $150,000 to $300,000 per year. Increased oversight is estimated to cost an $200,000 annually for the Authority's landfill gas operator, therefore costs could be up to $500,000 per year if lost revenues are factored. Despite these risks, odor-reduction benefits of enhanced landfill gas collection are significant, as it will reduce landfill gas emissions by approximately 20%, while reducing overall site odor by approximately 6%.

Based on the above, total costs for Tier 1 Landfill Mitigation Measures are estimated at $400,000 for capital facilities, with $740,000 in annual operational costs, which does not include any lost revenue from enhanced gas collection. These measures are needed to ensure an approximately 50% reduction of landfill-related odor, or an approximately 16% reduction in site-wide odor compared to the existing baseline, or an 8% site-wide reduction when adjusted according to the 2058 future estimate.

C. Monitoring/Site Operations

Due to the proximity of Placer Ranch Specific Plan to the WRSL, the Authority's time to respond to future complaints will be significantly curtailed. Technical Report #2 identifies enhanced monitoring, through the placement of odor sensors in the Placer Ranch Specific Plan, to identify spikes or other abnormal odor emissions ideally before community complaints materialize. Additional staff resources will be necessary, and an odor hotline will be needed to ensure positive community relations and timely responses to public concerns, whether perceived or based on actual emissions from the WRSL. Enhanced modeling is estimated to cost $200,000 in capital facilities or service updates to the Authority's odor monitoring and dispersion modeling system, and the hotline is estimated to cost $20,000 in technology or facilities costs. Community outreach is estimated to cost $100,000 annually, for 1,000 work hours by the Authority's landfill operator.

Site-wide mitigation measures involve the planting of trees, such as pine, eucalyptus or other aromatic foliage along the WRSL perimeter. Tree planting along the perimeter will reduce visual views of the landfill, which will have notable psychological effects for reducing odor impacts. Tree planting is estimated to cost approximately $500,000, plus $25,000 in annual costs for maintenance, care and replacement of trees. The Authority is omitting other site-wide options presented in Technical Report #2, such as construction of a wall, due to their limited effect in reducing odor emissions.

Based on the above, total costs for Tier 1 Monitoring/Site Operations are estimated at $720,000 for capital facilities, with $300,000 in annual operational costs. Although these Mitigation Measures do not contribute to a quantifiable reduction in odor emissions, they are necessary for ensuring that the Mitigation Measures overall are successful in reducing future disputes by residential communities and other occupancy-based uses within the Placer Ranch Specific Plan.

Tier 1 Summary:

Tier 1 Mitigation Measures, in total and as revised by the Authority pursuant to this letter, are estimated to cost $3,120,000 in new capital facilities, and $1,065,000 in annual operational costs. Tier 1 Mitigation Measures will reduce odor emissions at the WRSL by approximately 70% compared to the existing baseline, with a 35% reduction when compared to the 2058 future estimate.

Tier 2 Mitigation Measures:

Tier 2 Mitigation Measures will be implemented when development proceeds within the existing one-mile buffer. These measures are necessary to ensure a greater level of reduction, to address the increasing proximity of residential uses, sensitive odor receptors and other occupancy-based uses to the WRSL site, and the increased disposal amounts due to the buildout of the Placer Ranch Specific Plan overall.

A. Compost Operations

(1) Curing Controls

ASP techniques can be utilized on cured compost. This implementation will only be needed to achieve a high level of odor reduction; the Authority would not implement these additional controls if the Placer Ranch Specific Plan was not proposed for development. Implementing ASP on cured compost will incrementally reduce compost odor emissions by an additional 80%, after factoring odor reductions from ASP and Tier 1 implementation. The Authority can therefore achieve an incremental reduction of 96% for all composting (composting and curing phases) compared to the current baseline. The cost of implementing ASP on cured compost is estimated at $2,500,000.

(2) Improved Pond Aeration

Leachate is collected from composting activities and any other source on site that generates wastewater. Leachate from composting is rich in organic compounds that have a low odor threshold. As such, when leachate from composting is left unaerated or in anerobic conditions, it generates even higher odor emissions. By adding air or oxygen to the leachate treatment ponds, aerobic digestion of organic compounds increases the treatment capability and greatly reduces fugitive odors from leachate ponds. Although the Authority currently aerates, increased and improved pond aeration is needed to reduce odor emissions by an additional 5%. Improved pond aeration is estimated to cost $200,000 for new capital facilities, plus $10,000 in annual energy costs.

(3) Monthly Odor Testing

For Tier 2 implementation, odor screening will serve as an additional tool to ensure that odor reduction measures for active and cured compost piles occurs as needed to reduce direct impacts associated with the proximity of development proposed by the Placer Ranch Specific Plan. For Tier 2 implementation, monthly testing is necessary to identify issues with BMPs or other operational changes.

Technical Report #2 assumed one full-time employee, however, the Authority estimates that monthly odor testing, plus revisions to operations if needed, can be achieved with approximately 1,000 work hours annually, resulting in an estimated annual operational cost of $100,000.

Anaerobic digestion may be needed to address the implementation of SB 1383 and food-waste composting. Those odor impacts, however, cannot be accurately modeled at this time and the costs to implement digestion are relatively high, therefore they are not included in the proposed Tier 2 mitigation for compost operations.

Based on the above, costs for Tier 2 Compost Mitigation Measures are estimated at $2,700,000 for capital facilities, with $110,000 in annual operational costs. These measures will likely result in an additional, incremental reduction in compost-related odor by 80% (after factoring in reductions from ASP and other Tier 1 Mitigation Measures), for an overall site-wide reduction of approximately 12% compared to the existing baseline, or a 6% reduction compared to the 2058 future estimate.

B. Landfill Operations

(1) Posi-Shell

Posi-Shell is an enhanced form of landfill cover that uses a blend of clay, fibers, and polymers to produce a spray-applied mortar that dries in the form of a thin durable stucco. Tier 2 Posi-shell application will reduce landfill odor emissions by up to 5%. Posi-shell application is estimated to cost $200,000 in annual operational costs, due to the Posi-shell materials and staff time.

(2) Continuous Cover on Active Face

In addition to Posi-Shell, Tier 2 mitigation would entail use of a foam or other odor neutralizing products on the active landfill face during fill operations, similar to Tier 1 mitigation but with higher frequency. Continuous cover is estimated to cost an additional $200,000 in operational costs, based on product materials and work hours, and is estimated to reduce landfill odor emissions at the active face by 5%.

(3) Routine Gas Collection Checks

Additional monitoring will be needed to ensure that landfill gas leaks and emissions are not occurring on the above-ground system during gas collection. Technical Report #2 assumed one full-time staff position for this monitoring, however this monitoring can be feasibly implemented through 500 work hours annually, resulting in an estimated annual operational cost of $50,000.

Based on the above, Tier 2 Landfill Mitigation Measure are estimated to cost $450,000 annually. Other measures identified in Technical Report #2, such as community meetings, were removed due to the lack of measurable odor reduction for those mitigation strategies. The remaining measures are the minimum needed to ensure an additional reduction in landfill-related odor by 20%, for an overall odor reduction of approximately 6% at the WRSL site compared to the existing baseline, or a 3% reduction compared to the 2058 estimate.

Tier 2 Mitigation Summary:

Tier 2 Mitigation Measures, in total and as revised by the Authority pursuant to this letter, are estimated to cost $2,700,000 in new capital facilities, and $560,000 in annual operational costs, with a reduction in odor emissions of approximately 18% compared to the existing baseline study, or 9% when compared to the 2058 future estimate.

Conclusion

In summary, the overall odor reduction for Tier 1 and Tier 2 Mitigation Measures combined, as compared to the existing baseline, is approximately 86%. The projected odor reduction, as compared to the 2058 future estimate, is approximately 72%. Capital facilities are estimated to cost $5,820,000, and WRSL operations will incur additional annual costs of $1,625,000, both in 2019 dollars. The Authority is confident that the cumulative benefit of these Mitigation Measures will achieve up to a 90% reduction in odor emissions, compared to the existing baseline and up to a 50% reduction compared to the 2058 estimate.

If the above Mitigation Measures are implemented in accordance with a reasonable phasing schedule, the Draft EIR can reasonably conclude that odor-related impacts will be mitigated to a less-than-significant level, in that the odor impacts caused by residential and other land uses proposed by the Placer Ranch Specific Plan, and the development of those land uses within the existing landfill buffer, will be reduced to a level comparable to existing conditions, where odor issues may occasionally arise in the Placer Ranch Specific Plan, but will likely occur for less than a few hours at a time.

The Authority proposes these Mitigation Measures in addition to those currently provided in the Draft EIR. The Authority may propose Tier 3 and 4 mitigation measures in future environmental reviews, if odor-related issues become increasingly prevalent due to future development in direct proximity to the WRSL site.

Lastly, the Authority requests that objective standards be inserted into the proposed General Plan amendment, which would allow additional development in even closer proximity to the WRSL site, within 500 feet (or closer). The current amendment language merely refers to the adoption of a development agreement or specific plan, however, the General Plan amendment should acknowledge that additional measures, based on

objective standards such as DT's, may be needed to mitigate odor impacts for those projects.

Thank you for considering this request and for working productively with the Authority to address these issues in the Draft EIR.

Sincerely,

Churchwell **White** LLP

Robin R. Baral
RRB/dmg

cc: Western Placer Waste Management Authority Board
Michele Kingsbury, Principal Management Analyst, Placer County
Crystal Jacobsen, Principal Planner, Placer County
Eric Oddo, P.E., Program Manager, WPWMA

ATTACHMENT 1

Tier 1 and Tier 2 Mitigation Measures

Tier 1 Mitigation Measures	**Baseline Reduction/Future 2058 Reduction**
A. Compost Operations	
(1) Implement ASP Best Management Practices	
(2) Conduct Annual Odor Emission Test	
(3) Install Food Waste Mixing Building with Biofilter	
Tier 1 Site-Wide, Compost-Related Odor Controls	54% / 27%
B. Landfill Operations	
Active Landfill Mitigation Measures:	
(1) Install Odor Neutralizer to MRF Sorted Refuse	
(2) Adjust Active Fill Operations	
(i) Install Odor Neutralizer at Active Landfill Site	
(ii) Implement BMPs to Reduce Working Face of Landfill	
Inactive Landfill/Gas Collection Mitigation Measures:	
(1) Increase Frequency of Landfill Gas Emissions Screening	
(2) Enhance Landfill Gas Collection	
Tier 1 Site-Wide, Landfill-Related Odor Controls	16% / 8%
C. Monitoring/Site Operations	
(1) Install Odor Sensors and Perform Enhanced Dispersion Modeling	
(2) Install Odor Hotline	
(3) Plant Pine Trees and Other Aromatic Foliage Along WRSL Perimeter	
Tier 1 Site-Wide Odor Reduction	**70% / 35%**
Tier 2 Mitigation Measures	
A. Compost Operations	
(1) Implement Aerated Static Pile Processing on Cured Compost	
(2) Improve Pond Aeration	
(3) Conduct Monthly Odor Testing	
Tier 2 Site-Wide, Compost-Related Odor Controls	12% / 6%
B. Landfill Operations	
(1) Utilize Posi-Shell as Interim Cover	
(2) Implement Continuous Cover on Active Face	
(3) Conduct Routine Gas Collection Checks	
Tier 2 Site-Wide, Landfill-Related Odor Controls	6% / 3%
Tier 2 Site-Wide Odor Reduction	**18% / 9%**
Cumulative Site-Wide Odor Reduction	**90% / 50%**