1/13/11

Robert Carson
Park Services Division
City of Torrance
Torrance, CA 90503

RE: PRZ Sports Field Overview Assessment – Executive Summary

Dear Robert:

Thank you for choosing PRZ Sports Field Assessment for your facilities. We have designed this system to help you achieve sustainable turf on your sports fields. Using this tool will help you and PRZ to fine-tune your prescribed program and solve problems from season to season.

You have experienced what every major city and school district in the United States has experienced in the past 12-15 years-the explosion of soccer! Nationally, soccer play has grown 60% faster than the population in most areas. It is the reason that every baseball field outfield is a soccer field and why every park with open spaces has become a soccer field and none of your fields were ever designed to take this kind of wear.

There is a direct correlation between sports field wear and sports field maintenance! During this same 12-15 years that usage has grown this much, most fields were still being maintained at the level they were when fields were dedicated fields (one sport and when that season was over, the field was rested or allowed to mend). In many cases during this same period budgets and maintenance crews have been reduced while the acreage of turf has grown.

This difference between wear and maintenance equals unsustainable turf. **Also the specification that is still being used to build your new fields today is 50 years old and will guarantee failure on a multipurpose field in 2 years or less!**

This report is for only 7 sites and the recommendations that we are making here are if you just use them for these 7 sites. If you were to expand this report to all of your sites, the recommendations can change dramatically from site to site but you would know exactly what to do field by field, site by site citywide.

Here is what we found at these sites:

1. You have exceptionally high wear over all and the soil compaction and worn spots that accompany it. It is difficult keeping the turf sustainable on your fields under these conditions.

2. Your maintenance- there is a direct correlation between your wear level on your fields and your maintenance level. Your wear level on these fields is an average of 3.67 on a scale of 1-5, 5 being the highest wear. Your maintenance level on these fields is an average of .5, 5 being the highest. This difference between your wear level and your maintenance level has created unsustainability on most of the highest use fields. You also have irrigation problems on a few of these fields.

3. You have some fields with poor to fair grades that can make these fields less safe to play on and especially difficult to maintain when combined with your wear. Also your soils are easily compacted because of their silt and clay content and your fields were never designed to take the wear they are getting today.

4. Your reclaimed irrigation water is beginning to cause sodium accumulations in the two sites where this water is being used. You also have several other sites with higher levels of sodium in the soils.

At our Sport Field Maintenance & Design Seminars which we have been doing for 18 years all over the US, we teach that compaction is your number one enemy and deep roots are the key to growing turf that will tolerate the most wear. With deep roots (8"-10") your turf can mend very quickly, tolerate heat better in the summer, go dormant later in the fall and come out of dormancy earlier in the spring, use less water and fertilizer, have fewer diseases and will choke out weeds. The recommendations to follow will help you achieve these goals.

We are recommending that you:

1. Dramatically increase your maintenance level. This would mean repairing or replacing irrigation systems that are not covering properly, adding fertigation to increase wear-ability & save water and increasing maintenance tasks. We are also recommending the monthly application of a Primo growth regulator type product that will cut your mowing in half yet give you faster mending turf.

2. We are recommending the addition of a product called Sodium Blocker that will move the sodium out of the soils where it is beginning to accumulate. This product can be added to the same fertigation tank as the fertilizer we are recommending for your sites.

3. Properly renovate the fields that are in the worst shape possibly with the new-to-this-country but proven method in Europe "No-Till renovation". This means that the fields are amended properly, re-graded as if you had roto-tilled and grown them in but are ready to play on in 6 weeks from seed and for 1/3rd to ½ the cost of normal renovation procedures. Columbia is especially in need of this and El Nido will require full fledged renovation.

4. Make sure that all new fields are "**Designed from a Maintenance Point of View**"- our invention and one of our specialties. PRZ stands for Prescription Root Zone and this would mean that each field is engineered for the stabilization, percolation, soil chemistry and soil microbiology that will be required for this field to tolerate the wear you say you will be putting on it under your growing conditions (weather, soils etc).

5. Over-seed with a newer proven variety mix of Hybrid Blue Grasses that will not go dormant in your area, germinate very quickly for quick re-establishment, tolerate your wear and some shade (marine layer) better than your current varieties.

6. Hire an outside contractor with larger equipment to do most of the new maintenance tasks necessary to have sustainable turf.

7. Reduce as much play as you can from your high wear fields between December first and February first, the slower regenerative period for your cool weather grasses.

8. Find some set aside time during the peak growing season for each of the high wear fields that you are not already doing this on. The ideal time for your microclimate for this resting time would be from 5/1-6/30 or 6/1-7/30 as these are warmer months and the turf can heal faster.

These recommendations would normally be very expensive but the following report will also detail ideas that can offset the increased costs. We will show you how to make your maintenance or renovation dollars go the farthest.

This sports field assessment will give you the tools to:

1. Know which fields should re-done from the bottom up, and which ones can be fixed through the top.
2. Get the very most out of the fields you currently have. You will know field by field exactly how many hours of each sport they will handle each month of the growing season.

3. Utilize new out of-the-box funding ideas and methods for maintaining old and building new sports fields.
4. Plan when or if to add artificial turf fields and how to best use them for maximum results.
5. Use permitting of the user groups to assure sustainability of the Turf.
6. Interface better with other sports field owners to maximum usage out of all fields- Public Schools.
7. Direct funds so that you can achieve the most for the money spent and have sustainability of your turf!

We recommend that you follow the maintenance program we are specifying for these sites including fertigation, aeration, mowing, over-seeding and top dressing at the proper rates and time intervals. If you will do these things, you will discover over time that you will cut back on your fertilizer use and cost, and nearly eliminate the need for herbicides and fungicides and have dramatically improved sustainable turf!

This report is only the beginning. We are here to help implement any plans that we all develop together. We will help you implement the maintenance recommendations with your maintenance crews and the initial meeting is covered with the initial cost of this assessment.

Our initial fees cover us through the finishing of this report. If some of these recommendations become goals, we would need to write a specification that would be combined with your Sports Field Landscape Architect's to allow you to bid out the renovation costs. This would involve our Sports Field Design Services and we can give you a quote for this service.

Any further conference calls or changes or questions that need to be answered concerning this report, are covered in our initial fees through 2011. We can also help you write the specification to bid out all or part of the maintenance tasks or maintenance equipment discussed in this report for our hourly rate. Any trips for presenting to boards, committees or users groups or for implementing maintenance ideas with the crews would also be at our site visit rate.

After your review and comments, we will make any needed changes to this report, and send a hard copy along with the laminated copies of the maintenance calendars.

The following report identifies in detail the issues we found and how to address them.

Sincerely,

Larry Musser
President

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Field Overview Assessment
City of Torrance Sports Fields

The following is an evaluation of The City of Torrance Sports Fields as of December, 2010. This report discusses the current conditions of these fields and explains why they are in these conditions. It will then go over a plan of action that can help to remedy the problems and cover the maintenance steps, needed equipment, and costs of maintaining these fields to prevent them from returning to their original condition. This document will then show the level of wear on the fields and how many hours of play per week each field can sustain and still have viable turf.

Current Conditions of the fields

To have sustainable turf, you need 8”-10” of roots. As indicated in the chart below, all of your sports fields are too shallow rooted to stand up to the wear they are currently receiving. This is reflected in the bare and worn areas which result directly in low spots as well. Several of the fields have faulty coverage or poor irrigation and some have a poor field grade which contributes to standing water and damaged and worn turf by the end of the playing season.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Columbia Park	2.00	Poor	40%	50%	60%	Poor	40%	X	
Wilson Park	1.50	Fair	15%	30%	50%	Good			
Mc Master Park	2.50	Poor	50%	60%	60%	Ok	20%	X	
El Nido Park	2.00	V Poor	10%	40%		Ok		X	
Torrance Park	3.00	Fair	40%		50%	L Pressure	30%	X	
Walteria Park	2.00	Poor	25%	30%	45%	Ok		X	

The Causes of the Current Conditions

1. **Wear** has led to most of the current problems on these fields.
Your wear is the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that these fields have an average of **74.4 activity**-weighted hours of play per week. This is a category average **3. 67** wear level. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY
Columbia Park	726682	52	108.7	5.00
Wilson Park	306000	52	104.0	5.00
Mc Master Park	89676	52	40.7	1.50
El Nido Park	83980	52	107.1	5.00
Torrance Park	56680	52	33.9	2.00
Walteria Park	54612	52	52.2	3.50
Totals/ Averages	1317630	52	74.4	3.67

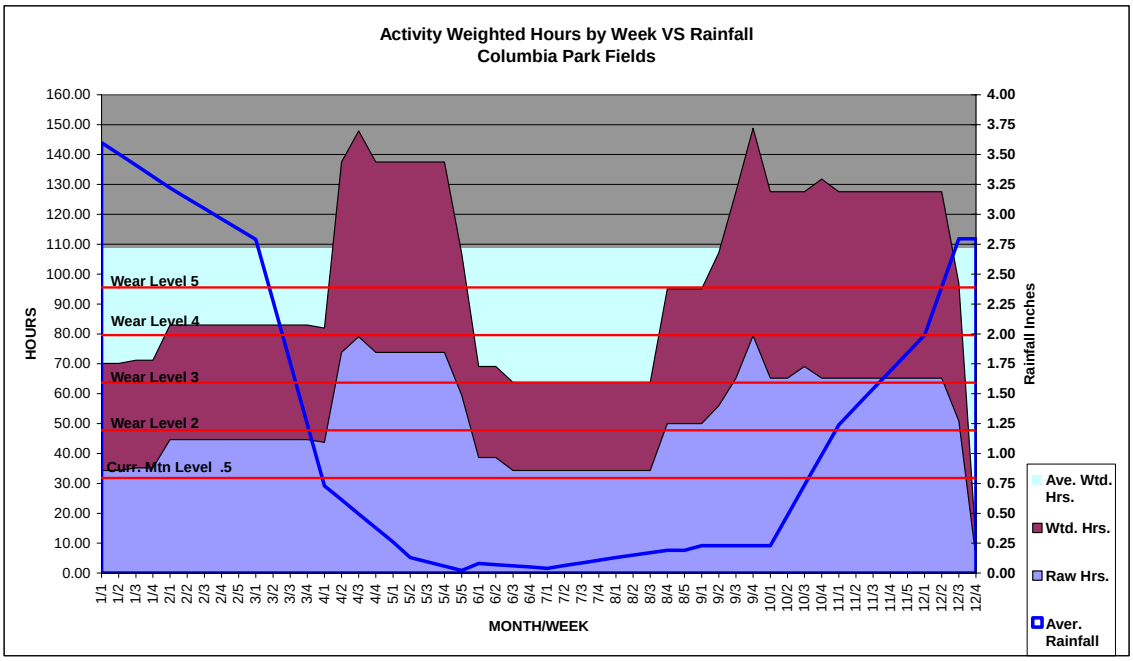
The following Activity Weighting Scale chart below shows the wear effect of each of the different sports and common activities that take place on sports fields. As you can see walking across a field is 1 and soccer practices are 2, meaning 1 hour of soccer practice is equivalent to 2 hours of walking or standing on the field. Also note that any sports clinics or tournaments carry a 2.5 rating which helps to explain the damage that can result from a week long clinic.

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practices	**2.00**
Adult Soccer & Football Games	**2.13**
Adult Soccer & Football Practice	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics	**2.50**

Note the following chart below titled Activity Weighted Hours by Week for Columbia Sports Fields. The light blue area indicates actual hours on the field. The magenta area represents the activity weighted hours on this field and the light green area represents the average activity weighted hours for the year. The heaviest wear on this field takes place in April and again in August (approximately 130 average activity weighted hours per week). The dark blue line represents rainfall and your highest rainfall occurs during higher wear periods in November and December.

The play that occurs during these months causes the most compaction and thus damaged turf. At various times during the year, the wear level fluctuates and the maintenance functions must also follow these fluctuations.



2. Reliable source of evenly applied irrigation water

Some of your fields have irrigation problems that keep you from having head to head coverage with matched precipitation over the entire field. At one site the water pressure is the culprit and the turf cannot be sustained with your wear and this lack of even coverage. This can put a strain on an already thinly spread work force as well as causing some parts of the fields to wear more than others.

3. The Current Maintenance Level of the Fields

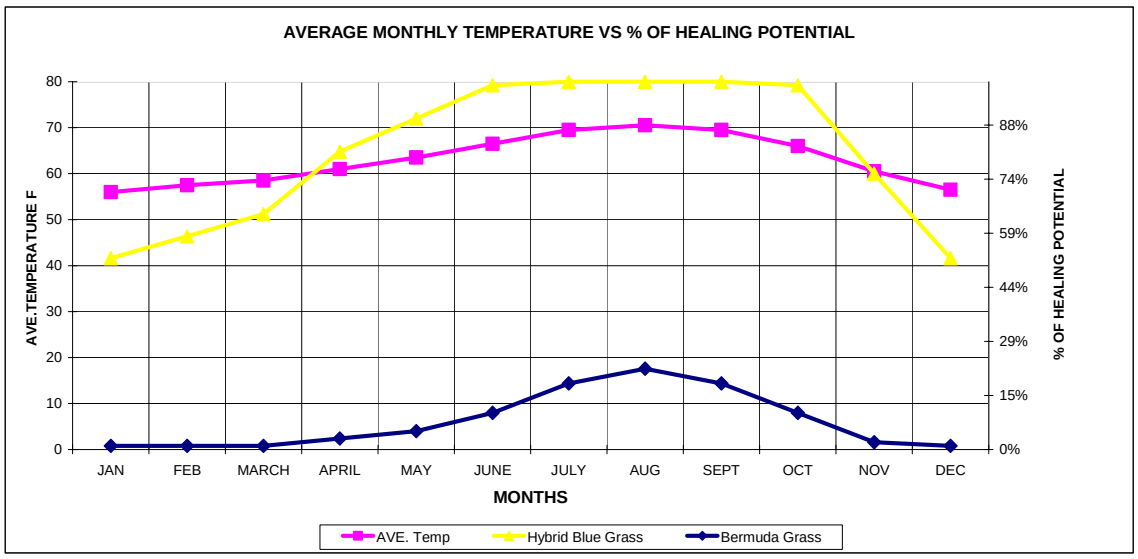
The Wear Index on the next page shows that all turf fields at these sites combined have an average category **3. 67 (with 3 of these at 5)** wear and your current maintenance level is an average .5. **There is a direct correlation between maintenance and wear**! This difference is substantial and is mainly responsible for your current conditions of your fields and equals unsustainable turf on your high wear fields and even on some of the other lower wear fields over time.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Columbia Park	726682	52	108.7	5.00	0.50
Wilson Park	306000	52	104.0	5.00	0.50
Mc Master Park	89676	52	40.7	1.50	0.50
El Nido Park	83980	52	107.1	5.00	0.50
Torrance Park	56680	52	33.9	2.00	0.50
Walteria Park	54612	52	52.2	3.50	0.50
Totals/ Averages	1317630	52	74.4	3.67	0.50

4. <u>The Growing Season and weather patterns</u>:

Please note the Average Monthly Temperature Chart below. When the monthly average temperature is less than 60 degrees, Bermuda grasses are dormant or going dormant. This chart also shows the percent of healing potential that your grass has at your average monthly temperatures. Months where there is a yellow box around the percentage of potential healing are those where the percentage drops below 50% and healing potential slows down dramatically.



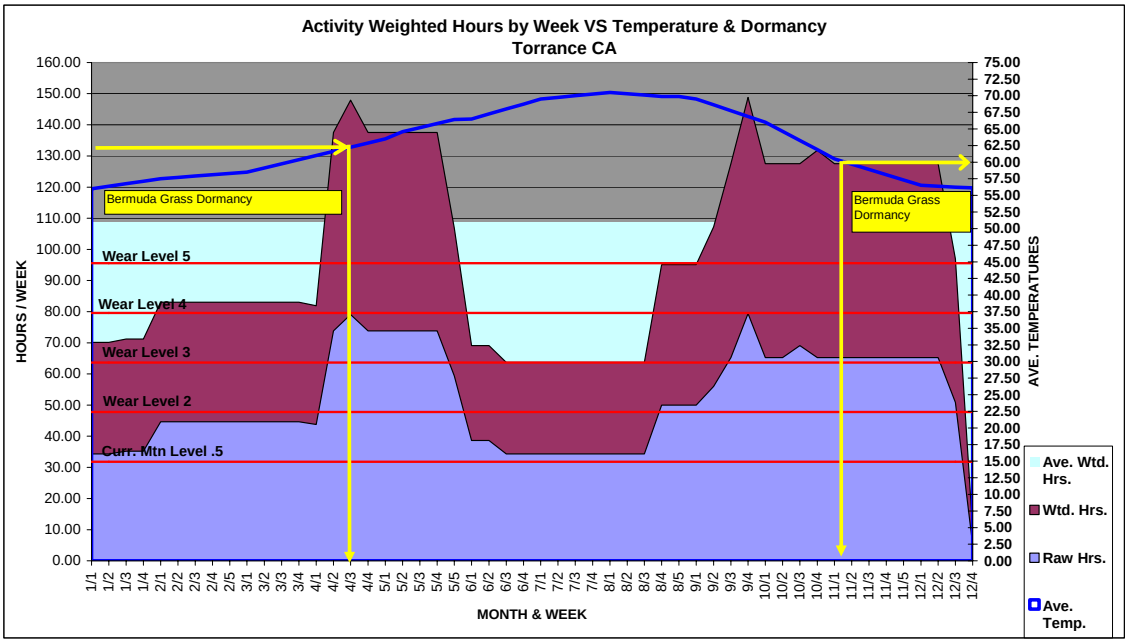
Type of Grass:

Torrance, CA	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Temeratures	56	58	59	61	64	67	70	71	70	66	61	57
Percent Of Healing Potential - Hybrid Blue Grasses	52.0%	58.0%	64.0%	81.0%	90.0%	99.0%	100%	100%	100.0%	99.0%	75.0%	52.0%
Percent Of Healing Potential - Bermuda Grasses	1.0%	1.0%	1.0%	3.0%	5.0%	10.0%	18.0%	22.0%	18.0%	10.0%	2.0%	1.0%

Indicates less than 50% of potential for mending.

This chart shows the average monthly temperatures for Torrance over the past 30 years. Note that this chart shows why cool weather grasses are much more effective here than Bermuda grasses for your microclimate. From April through November the cool weather grasses are nearly able to heal at their maximum potential but from December through March they have diminished healing potential. Also you can see at your temperatures Bermuda grasses never get above 22% of their healing potential.

The chart below for Columbia fields is like the first one above (Activity Weighted Hours by Week) but these numbers are compared to the temperatures that Bermuda grasses go dormant (63 degrees coming out of dormancy and 60 degrees going into dormancy). You can see that for you this is coming out by the third week in April and going into dormancy by the first week of November. Your wear that takes place during dormancy severely damages the turf and you can see that unfortunately at this site you have a great deal of wear during this time. The Hybrid Bluegrasses will not go dormant at your location. Until you can get a healthy stand of Hybrid Bluegrass at this site, it would be wise to vigorously protect the turf during this time by dramatically reducing the play if possible.



5. <u>The Soil Analysis</u>:

The following soil analysis comparison for the fields shows that these sites vary significantly and any maintenance plan must be customized for each site based on the all of the conditions mentioned. It shows that the root zone soil content of these fields ranges from an approximately 62% - 80% sand and 20% to 38% silt and clay. These silt and clay particles are the fine materials that when combined with high moisture and heavy play, allow these soils to be compacted easily. This wide range of soils between these sites shows the importance of soil testing all of your sites to insure that we can get the maximum wear out of each field at each site. A potential problem that immediately catches ones attention is the Boron levels at the two sites that have reclaimed water, Columbia and McMaster Parks. There are many trees, shrubs and other plantings that cannot tolerate a Boron level of over 2.5. This and other problems that are exposed by the soil testing and the fertilization needs will be customized for each field at each site and will be addressed in the maintenance manual for each site.

SOIL ANALYSIS COMPARISON

RECOMMENDED LEVELS	S.LOAM	3%+		50 PPM	212 PPM	15 PPM	1300 PPM	200 PPM	35 PPM	3 PPM	25 PPM	3 PPM	>1	>1 %	14-16
Columbia Park			**Sand%**	74.0%	**Silt%**	14.0%	**Clay%**	12.0%	**% Passing #200 Screen**			26.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.10	**0.81**	**No**	**Sandy Loam**	**5.20**	**25.00**	**140.00**	**414.00**	**40.00**	**2201.00**	**498.00**	**351.00**	**9.20**	**29.00**	**5.00**	**2.47**	**8.60%**	**17.74**
Wilson Park			**Sand%**	80.0%	**Silt%**	12.0%	**Clay%**	8.0%	**% Passing #200 Screen**			20.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.60	**0.39**	**Hi**	**Loamy Sand**	**4.70**	**8.00**	**140.00**	**142.00**	**32.00**	**2548.00**	**337.00**	**156.00**	**9.30**	**57.00**	**3.00**	**1.52**	**4.09%**	**16.59**
Mc Master Park			**Sand%**	68.0%	**Silt%**	19.0%	**Clay%**	13.0%	**% Passing #200 Screen**			32.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.40	**1.12**	**Hi**	**Sandy Loam**	**6.30**	**35.00**	**200.00**	**445.00**	**66.00**	**3424.00**	**490.00**	**414.00**	**21.30**	**36.00**	**3.00**	**3.15**	**7.16%**	**25.14**
RECOMMENDED LEVELS	S.LOAM	3%+		50 PPM	212 PPM	15 PPM	1300 PPM	200 PPM	35 PPM	3 PPM	25 PPM	3 PPM	>1	>1 %	14-16
El Nido Park			**Sand%**	80.0%	**Silt%**	12.0%	**Clay%**	8.0%	**% Passing #200 Screen**			20.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.30	**0.66**	**Low**	**Loamy Sand**	**4.50**	**6.00**	**104.00**	**150.00**	**69.00**	**2410.00**	**317.00**	**207.00**	**18.60**	**52.00**	**3.00**	**1.37**	**5.63%**	**15.98**
Torrance Park			**Sand%**	80.0%	**Silt%**	12.0%	**Clay%**	8.0%	**% Passing #200 Screen**			20.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.30	**0.27**	**No**	**Loamy Sand**	**5.90**	**5.00**	**310.00**	**118.00**	**23.00**	**2049.00**	**354.00**	**146.00**	**80.70**	**96.00**	**3.00**	**1.21**	**4.19%**	**15.13**
Walteria Park			**Sand%**	62.0%	**Silt%**	24.0%	**Clay%**	14.0%	**% Passing #200 Screen**			38.0%			
pH	**SALT**	**LIME**	**TEXTURE**	**ORGAN.**	**NIT.**	**PHOS.**	**POTAS.**	**SULF**	**CALC.**	**MAGN.**	**SOD.**	**ZINC**	**IRON**	**MANG.**	**Boron**		**CEC**
	MMMOS	**%**		**%**	**N PPM**	**P PPM**	**K PPM**	**S PPM**	**Ca PPM**	**Ma PPM**	**Na PPM**	**Zn PPM**	**Fe PPM**	**Mn PPM**	**B PPM**	**%NA**	
7.30	**0.71**	**Hi**	**Sandy Loam**	**7.00**	**11.00**	**170.00**	**496.00**	**60.00**	**2986.00**	**495.00**	**188.00**	**24.00**	**50.00**	**5.00**	**1.78**	**3.87%**	**21.14**

6. Irrigation Water

The irrigation water analysis on the next page compares side by side your current city water source with the reclaimed water that you are using on Columbia and McMasters. This reclaimed water is very high in chlorides and in sodium and would be described by the lab as “poor quality irrigation water”. Clay has a negative charge and sodium has a positive charge so the clay attracts and accumulates the sodium over time. As the sodium accumulates in the soil it slows down the percolation rate through the soil to the point that there is little oxygen getting down deep and the end result is shallow rooted turf that can’t defend itself. The chlorides are three times the level that can cause leaf toxicity when sprayed on the leaves and needles of trees in the heat of the day. Although the Boron level is not anywhere close to a toxic level, there is enough that this is the source of the high levels of Boron at Columbia and McMasters. We will be discussing this further when we cover the soil analysis of these two sites later in the maintenance manuals.

IRRIGATION WATER ANALYSIS

Reclaimed Water			Soil ,Root	2010	2010
		Normal	& Leaf	Reclaimed	Potable
Analysis	**Units**	Levels	Toxicity	Water	Water
Total Nitrogen	mg/l	5-50		1.8	0.6
Chloride	mg/l	0-70	>100	310	91.2
Sulfate	mg/l	30-90		136	166.8
Sulfate-Sulfur	mg/l				
Bicarbonate	mg/l	0-90	>500	251	
Carbonate	mg/l			<10	<10
Hydroxide, OH	mg/l	<10		<10	
Total Alkalinity	mg/l			251	
Hardness	mg/l			241	216
Hardness	gr./gl	0-200	>200	14	13
Total Calcium	mg/l	20-60		54	
Total Magnesium	mg/l	10-25		26	21
Total Potassium	mg/l	5-20		18	4
Total Sodium	mg/l	0-70	>210	203	86.2
Sodium Absorption Ratio SAF		<6	>9	5.7	4.4
Adjusted SAR	**SARa**			7.2	
Sodium,	**% of Cations**			49.8	
Boron	mg/l	<.7	>3	0.49	0.15
Total Iron,	mg/l			0.55	0
Total Manganese, Mn				0.19	
Phosphorus	mg/l	.3-1.21	>1.21	0.5	
Orthophosphate	mg/l			0.2	
Electrical Conductivity mmho		70	>1000	1400	828
Total Dissolved S	mg/l	<450	>450	912	494
Water pH				6.8	8.06

7. **<u>Many of your baseball fields have an unsafe lip at the edge of the skinned area</u>**

We will address some better fixes and ideas for preventing the lips in the first place later in the maintenance manuals.

8. **<u>Many of the fields have undulations and low spots in them.</u>**

This is naturally occurring on older fields over time if a top dressing program has not been part of your maintenance plan. This will be discussed in greater detail in the maintenance manuals.

Your Potential Solutions

1. **<u>You must dramatically increase your maintenance level</u>**

The following chart shows how far below your current maintenance program is in order to provide a sustainable level for your turf. You are at an average maintenance level of .5 and a wear level of 3.67. You can see how many of each task you are doing at each site and also how many you should be doing to achieve sustainable turf.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Columbia Park	0.50	5.00	34	156	0	12	0	1	0	1	0	6
Wilson Park	0.50	5.00	34	156	0	12	0	1	0	1	0	6
Mc Master Park	0.50	1.50	26	52	0	12	0	0	0	1	0	6
El Nido Park	0.50	5.00	26	119	0	12	0	1	0	1	0	6
Torrance Park	0.50	2.00	26	92	0	12	0	0	0	1	0	6
Walteria Park	0.50	3.50	26	122	0	12	0	1	0	1	0	6
AVERAGES	0.50	3.67	28.6	116.2	0	12.0				1	0	6

The major increase is in the number of aerations, fertilizations and mowings. This chart shows how many of each task you should be doing to maintain these fields. This report makes recommendations that will allow these numbers to change and dramatically change the sustainability of your turf. Category 3.67 level of wear requires a maintenance level of 3.67 which requires the following maintenance tasks:

- **Deep-tine or shatter-tine aeration at least once annually to relieve and prevent deep compaction.**
- **Annual Top dressing to re-level the field and to replace used up organics to the soil**
- **Six annual applications of fertilizer or fertigation to grow grass as fast as it is being worn off.**
- **Mowing 2-3 times a week during periods of high use because of the higher growth rate.**
- **Knife aeration at least monthly in the wear areas.**

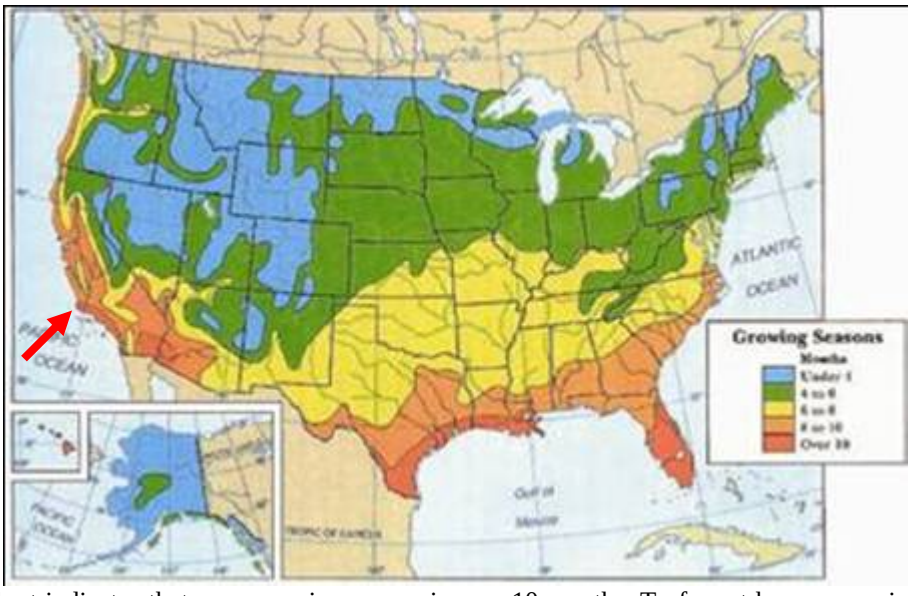
.

A. **Replace or repair the irrigation systems** on the fields where these are not adequate to deliver the correct amount of water with matched precipitation. Turf cannot mend itself under your high wear conditions without this.

B. You should consider implementing a set aside time each year (Major Spring Renovation Time) for healing damaged turf on the very high wear fields.

This should become an edict from the Parks and Recreation Commission and City council for your high wear fields to prevent user groups from getting around any maintenance plan during the down time. Your best time for turf regeneration and healing would be June 1 to July 30 Th when the healing potential of these grasses would be at their highest. May 1 to June 30 would also fit into this category.

C. Fertigation is the best and cheapest way to increase wear-ability while decreasing manpower.



This chart indicates that your growing season is over 10 months. Turf must have approximately 3.5% nitrogen in the leaf for the plant to defend itself. Even fertilizing several times a year (average for cities and school districts) would mean that there are many months that turf is unable to defend itself.

Fertigation allows you to grow-in, mend and renovate the wear areas of your fields the very quickest way possible. It also controls the mowing rate and maintains the beautiful dark green color throughout the growing season. When the fertilizer is delivered to the tanks by an outside contractor, there is a tremendous savings in manpower. Another added benefit is that organics can be added to the same tanks and this combination has caused the fields to require less water.

D. We recommend that you over-seed with a very aggressive Kentucky Blue grass and Texas Blue grass seed blend.

These seed varieties in the mix have:

A. Quick germination (8-9 days)
B. Quick Establishment (15 Weeks)
C. Remarkable wear tolerance
D. Shade tolerance
E. Fine leaf texture
F. Disease resistance
G. Dark green color
H. 1/3rd less water requirement than regular blue grasses
I. Extensive rhizomes & extensive lateral movement for quick repair

By over-seeding with the above product, you will see it take over your fields and allow you to use less water. Also the faster germination allows it to reestablish quicker on damaged fields.

E. The use of growth control products (Primo) will greatly enhance your maintenance program.

This type of product takes the energy produced by fertilization and mowing and causes the turf to mend much more quickly and to send roots down deep. It will normally cut mowing in half, however, in most cases you would need to add one or two mowings per week to keep up with the wear. You should be able to maintain these sites with 1.5-2 mowings per week but have substantially deeper roots and quick mending turf. Another very good side affect was discovered; the turf that was treated with this material has been coming out of dormancy at least 30 days earlier in the spring! You don't have dormancy here, but hopefully this product would make your turf more wear tolerant earlier in the spring.

3. <u>Reclaimed Irrigation water</u>

There is a product called sodium blocker that moves the sodium in the reclaimed water and in the soil out of the root zone so it can't affect the turf. It can be put in the fertigation tank with the regular fertilizer and applied at the appropriate rate. The pictures below are before and after pictures of the Rose Bowl Park area in Colorado Springs which has Kentucky bluegrass. The reclaimed water over time had turned the field into this. The picture on the right shows the park after one season with sodium blocker applied through the fertigation system along with the fertilizer. This would particularly help with sodium problems in the soils at Columbia and McMaster Parks and any other sites you might convert to reclaimed water later.

4. No-Till renovation of athletic fields

The fields that have bad grades and or poor irrigation systems will need to be renovated if you are ever to have sustainable turf. To totally renovate which would include soil amendments roto-tilled in, sod and new irrigation can cost as much as $3.00 per square foot. I believe that by utilizing no-till renovation, you could renovate those that need new irrigation for approximately $1.50 per square foot and those that have repairable irrigation for approximately $.50 per square foot. Our PRZ Design services can layout all of the proper steps, the costs and with the help of your Sports Field Landscape Architect, write the bid ready specifications.

Costs of Solving Your Problems

1. Manpower

The wear index chart on the next page indicates that by increasing your maintenance level from .5 to your wear level of 3.67, you will add 1,488 additional annual man-hours or approximately $60,471 annually in maintenance costs at these sites based on your current wages & benefits. This would be if you do these things in-house rather than contract them. By implementing the recommendations in this assessment, this figure can be substantially reduced. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Columbia Park	726682	52	108.7	5.00	0.50	217	942	725	$8,835	$38,296	$29,464
Wilson Park	306000	52	104.0	5.00	0.50	88	409	321	$3,578	$16,631	$13,054
Mc Master Park	89676	52	40.7	1.50	0.50	59	103	44	$2,382	$4,179	$1,797
El Nido Park	83980	52	107.1	5.00	0.50	57	223	166	$2,309	$9,056	$6,747
Torrance Park	56680	52	33.9	2.00	0.50	44	120	76	$1,802	$4,871	$3,068
Walteria Park	54612	52	52.2	3.50	0.50	49	206	156	$2,011	$8,354	$6,344
Totals/ Averages	1317630	52	74.4	3.67	0.50	515	2002	1488	$20,916	$81,387	$60,474

1. Annual Maintenance Costs-

On the next page, Scenario #1 below shows your current maintenance level and the $93,316 it cost you in 2010 to maintain the fields at these sites. This is $3,085 per acre per year. Scenario #2 shows the $311,432 in costs which is $218,116 more in additional manpower and materials for stepping up your maintenance from level .5 to level 3.67 if you were to buy the equipment needed and do this in-house. This is $10,296 per acre per year. Scenario #3 shows your annual costs of $461,401 which includes the cost of an outside contractor doing all of the maintenance tasks on these fields. This would be $15,254 per acre per year and is in the high range for high wear sports fields in your climate.

COMPOSITE SCENARIO COST ANALYSIS

		Scenario #1	Scenario #2	Scenario #3
		2010	2011	2012
		Current	New	Current
City of Torrance		Wear	Wear	Wear
Composite of the 6 Parks		Mtn Level	Mtn Level	Mtn Level
		0.50	3.67	3.67
		No New Equipment	In House Plus New Equipment	Out Source
	$/acre/yr	$3,085	$10,296	$15,254
Square Feet	**Natural Turf**	1,317,630	1,317,630	1,317,630
	ANNUAL TOTALS:	$93,316	$311,432	$461,401
Top dressing		$0	$24,298	
Outsourcing Maintenance		$0	$0	$390,000
Grass Seed		$0	$17,294	
Slit Seed- Contractor		$0	$0	$0
Fertilizer		$1,000	$21,052	
Deeptine aeration- Contractor		$0	$0	$0
Contractor Mobilization		$0	$0	$0
Manpower		$20,916	$81,387	
Water		$70,901	$70,901	$70,901
Irrigation repair		$500	$500	$500
Primo		$0	$0	
Field Striping		$0	$0	$0
Infield Materials		$0	$0	$0
Field Renovation		$0	$0	$0
Purchase New Equipment				
1 16' Rotary Mower			$70,000	
1 90" Aeway Aerator			$16,000	
1 60"Redexim Overseeder			$10,000	
5 Fertigation System installed				
New Equipment Costs	**$96,000**			

Sports Field Management System Manual

On the next page is the Sports Field Management System Annual Calendar for Columbia Park Fields that lays out every aspect of maintenance for each site. This is a sample and each calendar is customized for each site. The operator in the field will have a plastic laminated version of this. This particular calendar is

based on granular fertilizer. If you chose to go the recommended fertigation route, the liquid fertilizer applications would be shown instead. Down the left side are the dates that each fertilizer item and task should occur. This will be explained more thoroughly in the maintenance plan for each site.

DATE: **SQ.FT:** 726682 **Columbia Park Fields 2011 Maintenance Calendar**

12/29/10

APPLICATION SCHEDULE: **City of Torrance**

WEEK OF	30-5-10 Lbs	0-45-0 LBS	0-0-50 LBS	Blocker Gallons	Gypsum LBS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter Tine	Knife Aerate	Plug Aerate	Over Seed	Top Dress
01/08/11	2422	0	0	16.6	6867	0.00	3	2.0		X			
01/15/11							3	2.0					
01/22/11							3	2.0					
01/29/11							3	2.0					
02/05/11	0	0	0	16.6	0	0.00	3	2.0		X			
02/12/11							3	3.0					
02/19/11							3	3.0					
02/26/11							3	3.0					
03/05/11	2422	0	0	16.6	0	2.61	3	1.5		X			
03/12/11							3	1.5					
03/19/11							3	1.5					
03/26/11							3	1.5					
04/02/11	0	0	0	16.6	6867	2.61	3	1.5		X			
04/09/11							3	1.5					
04/16/11							3	1.5					
04/23/11							3	1.5					
04/30/11	2422	0	0	16.6	0	2.61	3	1.5		X			
05/07/11							3	1.5					
05/14/11							3	1.5					
05/21/11							3	1.5					
05/28/11							3	1.5					
06/04/11	0	0	0	16.6	6867	2.61	3	1.5	X	X	X	X	X
06/11/11							3	1.5					
06/18/11							3	1.5					
06/25/11							3	1.5					
07/02/11	2422	0	0	16.6	0	2.61	3	1.5		X			
07/09/11							3	1.5					
07/16/11							3	1.5					
07/23/11							3	1.5					
07/30/11							3	1.5					
08/06/11	0	0	0	16.6	0	2.61	3	1.5		X			
08/13/11							3	1.5					
08/20/11							3	1.5					
08/27/11							3	1.5					
09/03/11	2422	0	0	16.6	0	2.61	3	1.5		X			
09/10/11							3	1.5					
09/17/11							3	1.5					
09/24/11							3	1.5					
10/01/11	0	0	0	16.6	0	2.61	3	1.5		X			
10/08/11							3	1.5					
10/15/11							3	1.5					
10/22/11							3	1.5					
10/29/11	2422	0	0	16.6	0	2.61	3	1.5		X			
11/05/11							3	1.5					
11/12/11							3	1.5					
11/19/11							3	1.5					
11/26/11							3	1.5					
12/03/11	0	0	0	16.6	0	0	3	2.0		X			
12/10/11							3	2.0					
12/17/11							3	2.0					
12/24/11							3	2.0					
12/31/11	0	0	0	0.0	0	0	3	2.0					

30-5-10	14534	Gls			Lbs	.5 Mowings per week= Mowing every 14 days
0-45-0	0	Lbs	Primo	23.46	Gls	1 Mowing per week= Mowing every 7 days
0-0-50	0	Lbs	Magnes. KMAG	0	Lbs	1.5 Mowings per week = Mowing every 5 days
		Gls	Gypsum	20600	Lbs	2 mowings per week= Mowing every 4 days
		Lbs	Blocker	200	Gls	2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below is a sample of the customized chart for each field. This chart shows exactly how many Activity Weighted hours per week each field can handle for each month of the year. Since each field is so different from the others, a composite chart averaging the available hours for the fields would not be meaningful for your current conditions.

This chart is for the Columbia Park Fields. Note that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 4,163 activity weighted hours. Since there is soccer on this site with a rating of 2, this is an excess of 2,081 (4163 / 2) actual hours per year more wear than the turf can tolerate. When you step up your maintenance level .5 to level 5, you still have 35 more activity weighted hours per year or 17 actual hours of play annually more than your turf can tolerate and this is sustainable. The additional recommended maintenance techniques for this site will help but there is a limit to how much wear turf can handle. We need to look at some set aside time to rest, repair and lower the overall wear on this field.

City of Torrance

FIELD USAGE / AVAILABILITY ANALYSIS

Columbia Park Square Ft. 726682 **Total**

Type of Grass:	**Weeks/ Y**	52	**Hours**	**Average**	**Jan.**	**Feb.**	**March**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
HyBrid Blue	**Weeks/ mo**				4	5	4	4	5	4	4	5	4	4	4	4
Field Availability	**(Numbers represent activity-weighted hours per week)**															
Current Maint. Level 0.50	Hours Allowed	826	16.2	10.4	11.6	12.8	16.2	18.0	19.8	20.0	20.0	20.0	19.8	15.0	10.4
	Hours Available														
	Excess hours of usage	4163	80.3	60.3	71.4	70.2	110.0	113.4	46.6	43.8	56.3	99.7	108.8	112.5	87.5
Maint. Level 2.00	Hours Allowed	2477	48.5	31.2	34.8	38.4	48.6	54.0	59.4	60.0	60.0	60.0	59.4	45.0	31.2
	Hours Available														
	Excess hours of usage	2512	48.4	39.5	48.2	44.6	77.6	77.4	7.0	3.8	16.3	59.7	69.2	82.5	66.7
Maint. Level 3.00	Hours Allowed	3302	64.7	41.6	46.4	51.2	64.8	72.0	79.2	80.0	80.0	80.0	79.2	60.0	41.6
	Hours Available								12.8	16.2	3.7				
	Excess hours of usage	1686	32.5	29.1	36.6	31.8	61.4	59.4				39.7	49.4	67.5	56.3
Maint. Level 4.00	Hours Allowed	4128	80.8	52.0	58.0	64.0	81.0	90.0	99.0	100.0	100.0	100.0	99.0	75.0	52.0
	Hours Available								32.6	36.2	23.7				
	Excess hours of usage	860	16.6	18.7	25.0	19.0	45.2	41.4				19.7	29.6	52.5	45.9
Maint. Level 5.00	Hours Allowed	4954	97.0	62.4	69.6	76.8	97.2	108.0	118.8	120.0	120.0	120.0	118.8	90.0	62.4
	Hours Available								52.4	56.2	43.7	0.3			
	Excess hours of usage	35	0.7	8.3	13.4	6.2	29.0	23.4					9.8	37.5	35.5

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	5.0
Mowings/ Yr	34	156
Aerations/Yr	0	12
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$48,199	$130,121
Ann. Increase		$81,922
Cost/month	$4,028	$10,873
Cost/week	$1,007	$2,718

Activity Weighting Scale

Walking on field/Softb	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Prac	**2.00**
Adult Soccer & Footba	**2.13**
Adult Soccer & Footba	**2.25**
Lacrosse & Field Hock	**2.25**
Rugby	**2.50**
Sports Clinics	**2.50**
Current Wear Level	**5.00**
Current Maintenance Leve	**0.50**
Needed Maint. Level-Weather Adju	**5.0**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

When you find as you have that your maintenance level overall on the fields is much lower than the wear level, you have choices that need to be made. **What are some viable options?**

1. **You can raise your maintenance level to your wear level.**
   As this assessment has pointed out this is expensive! Hiring an outside contractor can possibly save you money on this one.

2. **You can lower your wear level to your maintenance level.**
   This is very hard to do without a user group committee that understands your dilemma and is willing to bite the bullet with you. This assessment can be very helpful in gaining this cooperation once these groups understand that they also are part of the problem and are willing to take ownership (not just a rent-a-field that someone else gets to pay for if they damage it)!

3. **You can add new fields to spread your wear over a larger area.**
   This is also very expensive in an area of high land prices and many times by the time they are built, they are already at full capacity.

4. **You can add artificial turf on lighted high wear fields.**
   This is very expensive at approximately $11 per square foot currently but it does double the amount of wear you can put on a field and you don't have to purchase new land.

5. **You can do a combination of these things.**

This concludes the Executive Summary for this report. The next step is for you to determine how many of these recommendations you wish to do. We will then put these steps into the maintenance manuals for each of these sites.

2011 Maintenance Instructions

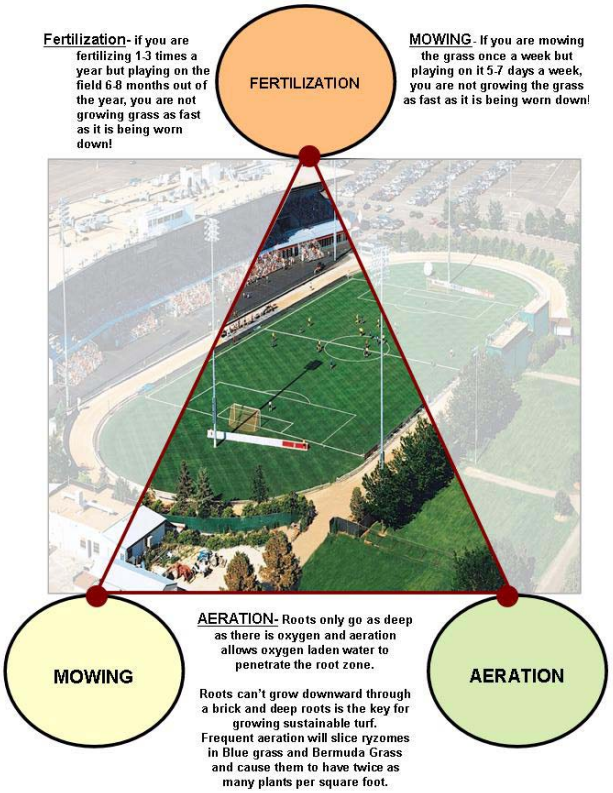
1. Our maintenance calendars to follow call for:

A. The Sports Field Maintenance Trifecta!

The Trifecta of turf maintenance as you can see below is increased:

a. Fertilization,
b. Mowing
c. Aeration.

As you will read below, this combination is what you must do for turf that is under heavy wear to for it to be sustainable. This combination will give you 10" of roots which is what is required for turf to tolerate the most wear!



B. **Increased fertilization**. The turf-grass has to have approximately 3% nitrogen in the leaf for it to defend itself against wear. For cool weather grasses this would normally be 5-6 lbs of Nitrogen per year per 1,000 sq. ft and 8 lbs/ 1,000 square feet on sand based fields or very sandy soils. Since you have not been doing any fertilization this will be a huge difference in costs.

C. **Fertigation** allows you to get approximately 20% of the nutrients through the leaf (foliar) and the rest going through the soil. This is especially affective during drought or water rationing. Our maintenance calendar calls for insuring that every drop of water that is applied to the turf, will have a trace of nitrogen in it. There is a supplier in your area that will custom blend for

your fields per our computerized recommendation that is customized for this site and can be changed as often as necessary. They will deliver to your tank for you or for the contractor that you would choose to do all or part of the new maintenance tasks. You will still need to spread some concentrated granular nutrients as well.

D. **Additional mowings**. The maintenance calendars to follow call for 2-3 mowings per week during the high wear periods because when you fertilize more, the easiest thing for the plant to do is make leaf. By continued 1 or 2 mowings per week all that you have accomplished is a 2" clipping instead of a 1" clipping. By mowing an additional time the plant uses this energy by trying to push the roots down and the bluegrass ryzomes sideways (this how bluegrass mends itself and fills in) but it can't do either if the plant is growing in a brick (compacted soil). Cool weather grasses, bluegrass, fescue and rye should be cut at 2.5 inches minimum or shorter cutting will actually pull the roots up closer to the surface. The new thermal blue grasses and Texas blue grasses I am recommending are finer bladed than these others and thrive at being cut at 2".

E. **More aeration**. By aerating monthly in the wear areas, you relieve the compaction which allows oxygen laden water to move downward and allowing roots to follow and ryzomes to spread sideways choking out weeds as well. Also slice aeration slices these ryzomes causing them to grow more plants per square foot thus a denser, tighter turf. The Aerway slice aerator we are recommending for you or your contractor will allow you to play on the field immediately after aeration since it has a roller that smoothes the surface and it leaves no plugs behind to disrupt the direction of the soccer ball or baseball. It also has a 7" fracturing tine that fractures as deep as 10" under ideal conditions and can leave a hole big enough to top dress into without pulling plugs.

F. **Primo Growth regulator**. The monthly application of Primo Max or Primo like growth regulator will allow you to mow ½ as much. The one mowing per week you were doing would now be two to three times a week but with the increased maintenance level, but with the application of Primo you can mow once a week or 1.5 times per week (every 5 days). The plant uses this energy to push roots down and ryzomes sideways.

G. **Annual top dressing** on all high wear fields. With the wear you have, you get compacted areas that become low spots. This means you have lost the grade on the field and it no longer drains properly. Top dressing fills in the low spots and reestablishes the grade on the fields. The top dressing should include compost and sand with an **80% sand 20% compost mix.** The compost is very high in microbes and helps to control funguses and diseases. They also help prevent compaction and when you slice aerate monthly, you slice the organics and sand into the root zone 6" deep and actually increase percolation in the root zone over time. **Be sure that you use topdressing that has no bark, fir or red wood in it.** These will create many problems for you over time by taking the nitrogen that you apply for the turf, away from the turf to break down the wood. We are recommending that initially you use **¼" of top dressing** to insure that you have enough material to fill in the low spots and to fill as many of the aeration holes as possible to create permanent avenues for water and oxygen to move freely downward. The results of the grade survey we discussed may increase this amount.

H. We are recommending that you over-seed with Seed Research Company's Texas and Kentucky Blue grass Hybrids. The mixture will include 30% Bandera, 30% Spitfire, 25% Touche' and 15% Emblem as marked below in their chart of Bluegrass classification. These will give you 1/3rd less water usage, tolerate some shade and a lot of wear, are fine bladed, they germinate in 8-9 days, are dark green in color and have the extensive roots and ryzomes that will knit sod and repair quickly to tolerate your wear. The same CPS company that will custom make your liquid fertilizer and deliver it to your tank, also can have these seed varieties custom blended for you by Seed Research of Oregon based on our recommendations.

High Density (Aggressive)	• Aggressive lateral growth • High shoot density • Very wear tolerant • Quickly knit sod and repair • May predominate in blend • Variable in other characteristics	Cheetah Orfeo Starburst Emblem	A-34 Bariris Brunswick Fairfax Julius Limousine	Mystic Northstar P-104 Touchdown Washington
Mid-Atlantic	• Deep, extensive roots and rhizomes • Vigorous turf and medium-high density • High summer stress tolerance • Early spring green-up • Good winter performance • Rapid recovery from disease • Leaf Spot susceptible except Touché and Preakness	Touché	Aura Cabernet Eagleton Livingston Monopoly	Plush Preakness Wabash Washington Zinfandel
Texas x Kentucky Hybrids	• Stress tolerant like Mid-Atlantic • Hybrids between Texas & Kentucky Bluegrasses • Heat tolerant • Extensive rhizomes • Drought tolerant with good recovery • Wear tolerant	Bandera Spitfire	DuraBlue Fahrenheit 90 Fire and Ice Longhorn	Reveille Solar Green ThermalBlue ThermalBlueBlaze

Updated: 11–09

Irrigation

Deep roots (10”) allow the turf grass to heal itself much quicker thus enable it to stand up to heavy wear. Roots only grow as deep as the oxygen goes and percolating water carries oxygen. Therefore until we achieve deep roots, we must maintain this downward percolating irrigation water through lighter more frequent watering rather than in-frequent heavy watering that tends to leave the soil wet and cause compaction. **Again this is only until we achieve deeper roots!**

The best way to decide how much water to put on is using a soil probe to check soil moisture in the root zone. We want the soil moist or damp but not wet evenly to at least 1” below the deepest roots. As the temperatures rise you will notice that it will be dryer near the surface than at the lower depths. This will mean adding extra minutes to each zone to keep the soil moisture correct. As the temperature continues to rise it may be necessary to go to an additional watering per day, one in the late evening and one in the early morning with a possible syringing in the heat of the day. When you first do this, use your probe to determine if you need to back off again on the minutes per zone keeping in mind again that you don’t want the soil to be wet in the morning.

Also use your probe regularly after rainfall to see how quickly it dries out. This will give you a good idea of how long you should keep play off the fields after a heavy rain. As compaction takes place from heavy wear, the time it takes to dry out after the rain will get longer. This is why it is necessary to knife aerate at least monthly during the heaviest of play.

Mowing Instructions

Your turf-grass on this field will be a Hybrid Kentucky Blue Grass mix that you should **mow at 2.”** each time. The slice aeration will cause the bluegrass ryzomes to start new plants closer to the parent plant thus creating more plants per square foot and denser turf thus making the 2” height play as if it were cut shorter. At this height you should not have to pickup the clippings except after heavier rainfall and the quick growth that can follow. The analysis of the leaf from your clippings on the next page reads like the analysis of a bag of fertilizer. The plant takes these nutrients out of the soil and uses them to maintain the plant. By throwing away these clippings you would actually be throwing away reusable fertilizer.

Total % N	Phos. %P	Pott. % K	Calcium % Ca	Magnes. %Mg	Sulfur %S
4.77	0.62	3.14	0.27	0.21	0.39

Mulching mowers prevent the need for picking up clippings.

Please note the **PRZ Turf Maintenance Calendar**. Your wear changes throughout your growing season and your mowing schedule follows the wear at **1-3 mowings per week or 1 to 1.5 mowings per week with Primo applications.**

Aeration

These fields are mostly a sand or sandy loam root-zone which normally have a good percolation rate but because you still have some clay and silt percentages, compaction is an important issue. Aeration is our best tool to relieve compaction. We have three types of aeration you will need to do on these fields annually to relieve compaction. The Aerway aerator we are recommending can be used in the afternoon and the field played on immediately. It does not leave behind any plugs and the roller on the back of it smoothes down any rough spots it may have created.

1. **Shatter-tine aeration** with the Aerway fracture tine machine in the most aggressive mode which should make a hole big enough to top dress into. This should be done once a year during the *Major Annual Turf Renovation* to relieve any compaction that might have taken place since last year.

2. **Core or plug pulling aeration** pushes a spoon or circular tube into the soil and pulls and slings or discards the soil and root plug onto the surface. This is the best type of aeration because it leaves a 1/2"-3/4" by 2.5"-4" hole in the soil and should also be done annually during the *Major Annual Renovation just before top dressing.* With your sandier soils it is not necessary to catch the plugs.

3. **Knife aeration** is the only aeration that is done regularly throughout the growing season because it temporarily relieves compaction without disturbing the surface or leaving plugs that could deflect the ball. Because of the sandier soils on these sites, you will only have to do this *monthly* with a **6"** turf slicing knife during the growing season. Do not go two directions with knife aerating because you can make an X with two slits that could be caught by a soccer cleat and ripped up. You can go in more than one direction during the Annual Renovation because these slits will mend before play resumes.

Material Suppliers and Contractors

The following materials are important to the maintainability of your fields. The specifications for each of these have been customized for this site and should not be altered by suppliers who might indicate that their products are equal to or better than those specified.

1. Top Dressing material shall be an 80% sand, 20% compost mixture.
   A. Sand specifications are for a washed USGA sand with 100% passing a #12 screen and no more than 1% passing a #200 screen.
   B. Sand Supplier- West Coast Aggregate- Mike Dickens-760-399-1891, West Coast Sand & Gravel- Dante-800-734-3053. The last two are capable of mixing compost and sand and delivering them to you that way.
   C. Compost needs to be screened to 1/4" minus, have a carbon to nitrogen ratio of under 20/1, have a pH less than 8.5 and a dry organic % above 30%. Supplier –Greenway's Environmental-Kevin-949-380-8301
   D. Quantities of mixture 1/4" the first year. or .775 cubic yards /1,000 sq. ft. of the above mixture.
2. Seed: Texas Bluegrass and Kentucky Blue grass mix with 4 varieties 30% Spit Fire Hybrid Blue grass, 30% Bandera hybrid Blue grass, 25% Touche' Mid Atlantic type Blue grass and 15% Emblem a High Density type Blue grass all from Seed Research of Oregon.
   A. Suppler shall be CPS-Chris 760-594-1385

B. Quantities are, 1.5lbs/1,000 sq. ft for over-seeding and 3.5 lbs per 1,000 sq. ft on new areas.
C. Shall be slit seeded at ¼" depth at .75lbs per 1,000 square feet in each of two directions.

3. Fertilizers: Both granule and liquid fertigation products:

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Nitrogen	Phos	Potassium	LFA	Primo	Sodium	Calcium	
Product				0.00	Max	Blocker	Gypsum	
Formulation	30-5-10	0-45-0	0-0-50			N/A		
Form	Lbs	Lbs.	Lbs	Gallons	Gallons	Gallons	lbs./bags	
All Fields	24600	0	1940	0	46	345	20600	
Cost Each	0.46	0.30	0.50	16.50	316.85	16.00	0.16	
Total Cost	$11,316	$0	$970	$0	$14,622	$5,518	$3,249	$35,674

A. Custom Blended Liquid N-30%, -P -5%, K-10%,
B. Gypsum-23% calcium , Magnesium-22%
C. Primo Max substitute- Provair PGR or T-Nex 1 AQ, Active ingredient 11.3% Trinexapac-ethyl-
    a. Suppler shall be CPS-Chris 760-594-1385
D. Sodium Blocker (moves sodium out of the root-zone, reduces soil pH, increases soil percolation, reduces sodium EC %, allows reclaimed water to be used on salt intolerant blue grasses)- Supplier-Turf Feeding Systems-Michael Chaplinsky-713-504-0750

4. Contractors- If the local contractors do not have all the equipment to do all of the maintenance tasks we are specifying, this contractor does a lot of work in SOCAL and can do what some of them can't, particularly if it is a once a year type maintenance such as top dressing or over-seeding.
A. No-Till Renovation, Deep Tine aeration, top dressing, over seeding, fertilization, Koro Recycle Dresser that makes topdressing from your root-zone while fracturing every square inch of root-zone 8" deep while leaving it in place, Baseball field lip removal (see pictures on next page), and Koro Kwik Drain- 4" an hour drainage system installed entirely by machine through the top-Green One Industries Co- Leroy 888-567-6872,

B. Soil testing, Servitech Labs (620) 227-7123.

Equipment Recommendations for Contractors

The annual turf maintenance calendar for the city of Torrance is calling for 2-3 mowings per week, annual top dressing, annual over-seeding, monthly slice aeration and 6 fertilizer applications per year (either granule or liquid fertigation) for the high wear fields.

It will be important for the contractor to use the larger pieces of equipment in order to get on and off the fields in the shortest period of time and not interfere with play anymore than necessary. Therefore we are recommending 16 foot rotary mowers, 90" or larger knife aerators, 4-5 yard top-dresser, 5-6 ft. over-seeder without the dethatching flails in the front.

1. Fertigation Systems
   - A. Fertigation Systems should all be golf course quality with pumps that are used by municipal water and sewer systems for adding chlorine to potable water and waste water.
   - B. The size of each system is based on the acreage that each system will feed. Columbia (Model L 1000A); Wilson (Model L700); McMaster (Model L500 B) El Nido, Torrance and Walteria (Model L550 A),
   - C. Recommended Supplier- Turf Feeding Systems-Michael Chaplinsky-713-504-0750 I can help write a specification for each site if you need to bid these.

2. Over seeder
   - A. Over seeder should be wheel driven not PTO driven (3 times faster than PTO)
   - B. Recommended Seeder-Redexim-Charterhouse Model #1575 (60"
   - C. California dealer-Turf & Industrial Supply- Santa Clara-Jim Sherman-405-595-7358

3. Top Dresser
   - A. The Top-dresser should be a 4 yard machine
   - B. Top dresser should have the 6 foot broom for throwing material straight down on sports fields verses spinner that spreads very lightly 30 foot wide.
   - C. Recommended top-dresser-Tycrop TD-460 or MH-460 (material handler).
   - D. Recommended dealer- Now handled by Toro Company-Turf Star-Hayward CA-800-585-8001.

Field Overview Assessment
Columbia Park Fields

The following is an evaluation of the Columbia Park fields as of December, 2010. It discusses the current condition of this field and explains why it is in this condition. It will then go over a plan of action that can help to remedy the problems and cover the maintenance steps, needed equipment, and costs of maintaining this field to prevent it from returning to it's original condition. This document will then show the level of wear on the field and how many hours of play per week this field can sustain and still have viable turf.

Current Conditions of the fields

The 2" root depth is too shallow to stand up to the wear it is currently receiving. The irrigation system on this field very poor and is about to be renovated.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Columbia Park	2.00	Poor	40%	50%	60%	Poor	40%	X	

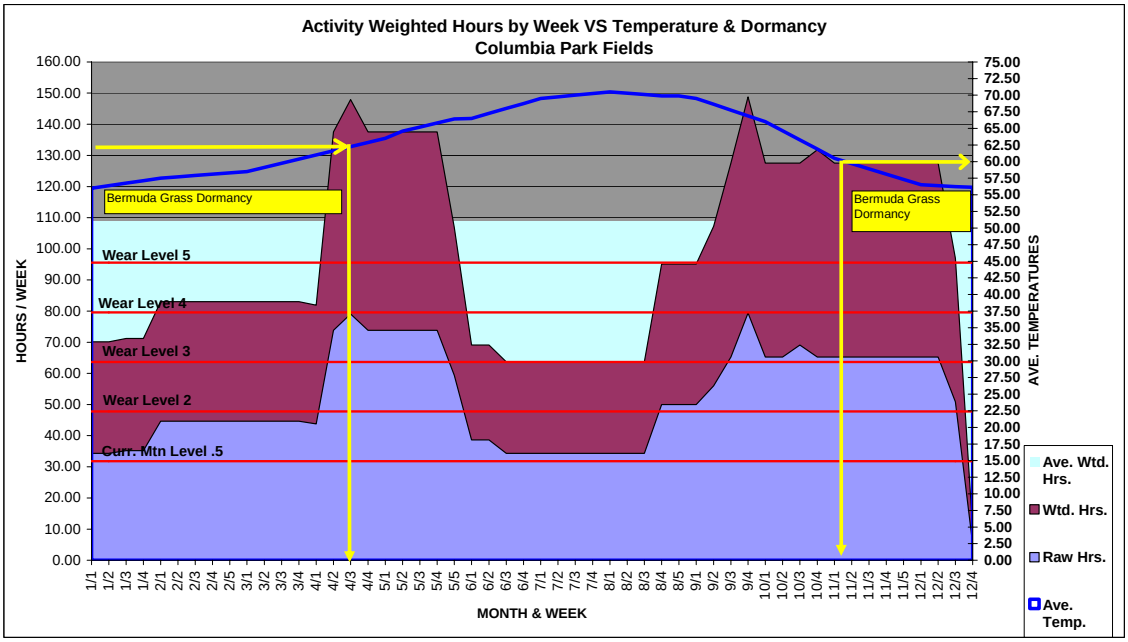
The Causes of the Current Conditions

1. Wear has caused most of the current problems on these fields.
Your wear is probably the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that this field has **108.7** activity-weighted hours of play per week. This is a category **5** wear level. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance. Your current maintenance level is .5 and has allowed this field to deteriate.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Columbia Park	726682	52	108.7	5.00	0.50

Note the chart on the next page titled Activity Weighted Hours by Week for this field. Bermuda grass goes into dormancy the first week in November and doesn't come out of dormancy until the third week in April. Since some of your heaviest wear takes place in November and December, you must over-seed with a cool weather grass. Earlier we explained the benefits of the Hybrid Bluegrasses and are recommending over-seeding these fields with them.



2. The Current Maintenance Level of the Fields

The Wear Index shows that these fields have a category **5** wear and your current maintenance level is .5. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings. The mowings would be cut in half if you follow our recommendations for using a Primo type growth regulator that uses the energy from the additional fertilizations to mend and drive roots down.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Columbia Park	0.50	5.00	34	156	0	12	0	1	0	1	0	6

3. The Soil Analysis:

The soil analysis for Columbia fields on the next page shows that they have a Sandy Loam (74% sand) root zone. This type of soil is the best to have because it does not compact as easily as heavy clay soils but there is still enough silt and clay to compact under the heavy play you have at this site. This site is one of the two sites that are in very bad condition and should be either completely renovated from the bottom up or may possibly be a candidate for the no-till renovation process which can cost as much as 1/3rd to ½ the cost of compete renovation. The grades are very poor with nearly ½ of the turf completely gone and another 25% in the process of going away. This site is also on reclaimed irrigation water and as discussed earlier in the executive summary, it is not good water. The sodium, chlorides, and %Na of the cations are all high and will definitely affect the percolation rate of the soils here over time. Also on a side note, the boron level of 2.47 is high enough to affect some plants and trees but does not affect turf grasses that are mowed regularly. Fertigation is by far the best way to fertilize this site and a sodium blocker product can be added that will move sodium down and out of

the root-zone and allow you to use the salt intolerant Hybrid Blue grasses. Once these fields are renovated, they will need to be top dressed annually to maintain the new grades. We are recommending monthly slice aeration which slices the ryzomes on Kentucky Blue grass and causes there to be more plants per square foot which makes the turf denser and this improves wear-ability. This site will require nitrogen, potassium and calcium. As we mentioned earlier the boron levels at 2.47 are elevated because of the reclaimed water but are not a threat to the turf grass.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	COP. Cu PPM	Boron B PPM
7.10	0.81	No	Sandy Loam	5.20	25.00	140	414	40	2201	498	351	9.20	29.00	5.00	1.60	2.47
RECOMMENDED LE		LOW	S.LOAM	3.5%+		50 PPM	487	15 PPM	2478	318	35 PPM	3 PPM	25 PPM	3 PPM	1.50	0.75
LBS/ 1000 SQ FT. NEEDED					6.00	0.00	1.46	0.00	6.52	0.00		0.00	0.00	0.00	0.00	0.000
							<800									

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
18	0%	6%	62%	23%	9%	170
RECOMMENDED LEV: 12-14					<5	<150

SAND%	SILT%	CLAY%
74.00%	14.00%	12.00%

Below is a comparison of the leaf analysis and soil analysis taken in December of this year.

Leaf Analysis Comparison

	Total % N	Phos. % P	Pottas. % K	Calci. % Ca	Magn. %Mg	Sulfur % S	Zinc Zn ppm	Iron Fe ppm	Mang. Mn ppm	Copper Cu ppm	Boron B ppm	Sodium % Na
Columbia	**3.4-4.5**	**0.35-0.8**	**3-4%**	**0.4-1.25**	**0.25-0.6**	**0.25-0.6**	**20-65**	**80-250**	**50-200**	**9-20 ppm**	**10-50 ppm**	**0.01-.250**
12/1/2010	3.94	0.38	2.52	0.45	0.23	0.31	73	869	73	12	19	0.315
Recyled Water			Low	Marginal	Low							

Soil Analysis Comparison

Columbia	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Minimum	**5.00**	**50.00**	**200.00**	**1400.00**	**300.00**	**15.00**	**3.00**	**15.00**	**2.00**	**1.50**	**0.75**	**30.00**
12/1/2010	25.00	140.00	414.00	2201.00	498.00	40.00	9.20	29.00	5.00	1.60	2.47	351.00

Only leaf analysis would indicate if the plants are getting enough. All of the levels of the nutrients appear to be well above the minimums in the soils, but the leaf analysis says that the potassium, calcium and magnesium are being bound up in the soil and not available to the plant. This is caused by the high sodium levels in the reclaimed water. As mentioned above, the sodium blocker product will be a must on this site to move the sodium down and out of the root zone so we can insure that the Hybrid Blue grasses will survive and flourish on this site.

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to your wear level of 5, you would need to add 725 additional annual man-hours or approximately $29,464 annually in maintenance costs on these fields based on your current wages & benefits if you were to try to do this your self. We believe you can find a contractor who can do this for less than this. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Columbia Park	726682	52	108.7	5.00	0.50	217	942	725	$8,835	$38,296	$29,464

2. Fertilizer Costs

The fertilizer costs below reflect the 6lbs per 1,000 sq ft of N required by high wear hybrid blue grass fields.

2. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $48,199 it costs you annually to maintain these fields. This is $2,889 per acre per year. Scenario #2 shows the $130,121 in costs which is $81,922 more in additional manpower and materials for stepping up your maintenance from level .5 to level 5 if you do the work your selves without implementing the recommendations in this report, except the additional maintenance tasks. This would be $7,800 per acre per year. Scenario #3 shows your annual cost including the one time charge for new fertigation equipment that is needed or $109,045. This would be $6,537 per acre for this year. Scenario #4 shows the $94,552 in annual costs of maintaining your fields after the purchase of the new equipment. This is $5,668 per acre per year which is in the very low range for high wear fields in your climate.

Columbia Park

SCENARIO COST ANALYSIS

	Scenario #1	**Scenario #2**	**Scenario #3**	**Scenario #4**
	2010	**2011**	**2011**	**2012**
	Current	**Current**	**Current**	**Current**
	Wear	**Wear**	**Wear**	**Wear**
	Mtn Level	**Mtn Level**	**Mtn Level**	**Mtn Level**
	0.50	**5.0**	**5.0**	**5.0**
	No New	**No New**	**Purchase**	
	Equipment	**Equipment**	**New**	
			Equipment	
	$2,889	$7,800	$6,537	$5,668
Square Feet	726,682	726,682	726,682	726,682
ANNUAL TOTALS:	$48,199	$130,121	$109,045	$94,552
Top dressing	$0	$13,838	$6,919	$6,919
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$9,538	$9,538	$9,538
Slit Seed- Contractor	$0	$0	$0	
Fertilizer	$0	$20,561	$12,537	$12,537
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Manpower	$8,835	$38,560	$25,708	$25,708
Water	$38,864	$38,864	$38,864	$31,091
Irrigation repair	$500	$500	$500	$500
Primo		$8,259	$8,259	$8,259
Field Striping	$0	$0	$0	$0
Infield Materials				
	$0	$0		$0
1 Fertigation Ssytem			$6,720	

Sports Field Management System Manual

Below is the Sports Field Management System Annual Calendar that lays out every aspect of maintenance for each site. Each calendar is customized for each site. The operator in the field should have a plastic laminated version of this.
This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to reflect your capabilities. It currently calls for a granular/liquid program even though we are recommending fertigation. It also calls for spraying the Primo product monthly during the growing season. This product cuts your mowing approximately in half but would need to applied monthly to get the benefit from it.

DATE: 12/29/10 **SQ.FT:** 726682

Columbia Park Fields 2011 Maintenance Calendar

APPLICATION SCHEDULE: City of Torrance

WEEK OF	30-5-10 Lbs	0-45-0 LBS	0-0-50 LBS	Blocker Gallons	Gypsum LBS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter Tine	Knife Aerate	Plug Aerate	Over Seed	Top Dress
01/08/11	2422	0	0	16.6	6867	0.00	3	2.0		X			
01/15/11							3	2.0					
01/22/11							3	2.0					
01/29/11							3	2.0					
02/05/11	0	0	0	16.6	0	0.00	3	2.0		X			
02/12/11							3	3.0					
02/19/11							3	3.0					
02/26/11							3	3.0					
03/05/11	2422	0	0	16.6	0	2.61	3	1.5		X			
03/12/11							3	1.5					
03/19/11							3	1.5					
03/26/11							3	1.5					
04/02/11	0	0	0	16.6	6867	2.61	3	1.5		X			
04/09/11							3	1.5					
04/16/11							3	1.5					
04/23/11							3	1.5					
04/30/11	2422	0	0	16.6	0	2.61	3	1.5		X			
05/07/11							3	1.5					
05/14/11							3	1.5					
05/21/11							3	1.5					
05/28/11							3	1.5					
06/04/11	0	0	0	16.6	6867	2.61	3	1.5	X	X	X	X	X
06/11/11							3	1.5					
06/18/11							3	1.5					
06/25/11							3	1.5					
07/02/11	2422	0	0	16.6	0	2.61	3	1.5		X			
07/09/11							3	1.5					
07/16/11							3	1.5					
07/23/11							3	1.5					
07/30/11							3	1.5					
08/06/11	0	0	0	16.6	0	2.61	3	1.5		X			
08/13/11							3	1.5					
08/20/11							3	1.5					
08/27/11							3	1.5					
09/03/11	2422	0	0	16.6	0	2.61	3	1.5		X			
09/10/11							3	1.5					
09/17/11							3	1.5					
09/24/11							3	1.5					
10/01/11	0	0	0	16.6	0	2.61	3	1.5		X			
10/08/11							3	1.5					
10/15/11							3	1.5					
10/22/11							3	1.5					
10/29/11	2422	0	0	16.6	0	2.61	3	1.5		X			
11/05/11							3	1.5					
11/12/11							3	1.5					
11/19/11							3	1.5					
11/26/11							3	1.5					
12/03/11	0	0	0	16.6	0	0	3	2.0		X			
12/10/11							3	2.0					
12/17/11							3	2.0					
12/24/11							3	2.0					
12/31/11	0	0	0	0.0	0	0	3	2.0					

30-5-10	14534	Gls			Lbs	.5 Mowings per week= Mowing every 14 days
0-45-0	0	Lbs	Primo	23.46	Gls	1 Mowing per week= Mowing every 7 days
0-0-50	0	Lbs	Magnes. KMAG	0	Lbs	1.5 Mowings per week = Mowing every 5 days
		Gls	Gypsum	20600	Lbs	2 mowings per week= Mowing every 4 days
		Lbs	Blocker	200	Gls	2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

Note that on the chart below that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 4163 activity weighted hours. Since there is soccer on this site with a rating of 2, this is an excess of 2081 (4163 / 2) actual hours per year more than the turf can tolerate. When you step up your maintenance level .5 to level 5, you still have 35 activity weighted hours per year or 18 actual hours of play annually more than your turf can tolerate but we can sustain your turf at this level.

City of Torrance

FIELD USAGE / AVAILABILITY ANALYSIS

Columbia Park Square Ft. 726682 **Total**

Type of Grass: **Weeks/ Y** 52 **Hours Average**

HyBrid Blue **Weeks/ mo**

				Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
				4	5	4	4	5	4	4	5	4	4	4	4
Field Availability		**(Numbers represent activity-weighted hours per week)**													
Current Maint. Level 0.50	Hours Allowed	826	16.2	10.4	11.6	12.8	16.2	18.0	19.8	20.0	20.0	20.0	19.8	15.0	10.4
	Hours Available														
	Excess hours of usage	4163	80.3	60.3	71.4	70.2	110.0	113.4	46.6	43.8	56.3	99.7	108.8	112.5	87.5
Maint. Level 2.00	Hours Allowed	2477	48.5	31.2	34.8	38.4	48.6	54.0	59.4	60.0	60.0	60.0	59.4	45.0	31.2
	Hours Available														
	Excess hours of usage	2512	48.4	39.5	48.2	44.6	77.6	77.4	7.0	3.8	16.3	59.7	69.2	82.5	66.7
Maint. Level 3.00	Hours Allowed	3302	64.7	41.6	46.4	51.2	64.8	72.0	79.2	80.0	80.0	80.0	79.2	60.0	41.6
	Hours Available								12.8	16.2	3.7				
	Excess hours of usage	1686	32.5	29.1	36.6	31.8	61.4	59.4				39.7	49.4	67.5	56.3
Maint. Level 4.00	Hours Allowed	4128	80.8	52.0	58.0	64.0	81.0	90.0	99.0	100.0	100.0	100.0	99.0	75.0	52.0
	Hours Available								32.6	36.2	23.7				
	Excess hours of usage	860	16.6	18.7	25.0	19.0	45.2	41.4				19.7	29.6	52.5	45.9
Maint. Level 5.00	Hours Allowed	4954	97.0	62.4	69.6	76.8	97.2	108.0	118.8	120.0	120.0	120.0	118.8	90.0	62.4
	Hours Available								52.4	56.2	43.7	0.3			
	Excess hours of usage	35	0.7	8.3	13.4	6.2	29.0	23.4					9.8	37.5	35.5

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	5.0
Mowings/ Yr	34	156
Aerations/Yr	0	12
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$48,199	$130,121
Ann. Increase		$81,922
Cost/month	$4,028	$10,873
Cost/week	$1,007	$2,718

Activity Weighting Scale

Walking on field/Softb	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Prac	**2.00**
Adult Soccer & Footba	**2.13**
Adult Soccer & Footba	**2.25**
Lacrosse & Field Hock	**2.25**
Rugby	**2.50**
Sports Clinics	**2.50**
Current Wear Level	**5.00**
Current Maintenance Leve	**0.50**
Needed Maint. Level-Weather Adju	**5.0**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
Wilson Park Fields

Current Conditions of the fields

The 1.5" root depth is too shallow to stand up to the wear they are currently receiving. This is caused by the compacted soils as are the weeds and bare spots. The irrigation system is good but the grades are only fair.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Wilson Park	1.50	Fair	15%	30%	50%	Good			

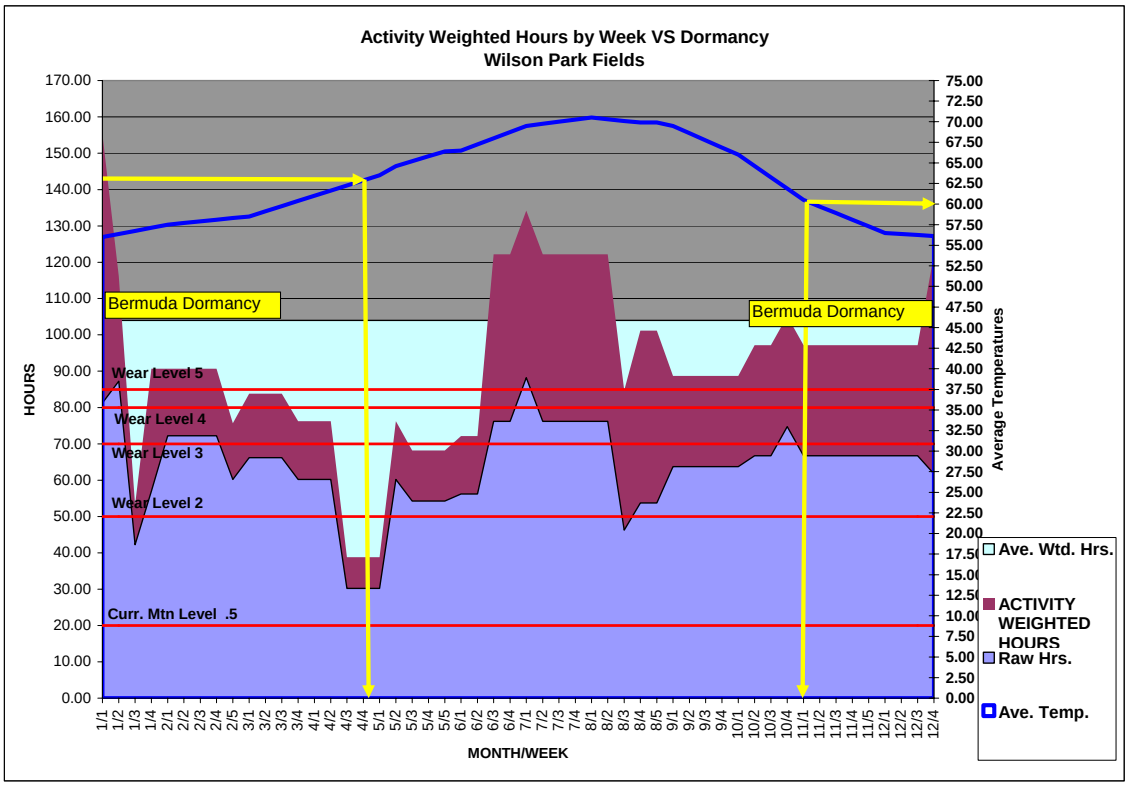
The Causes of the Current Conditions

1. Wear has led to many of the current problems on these fields.
Your wear is probably the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that this field has **104** activity-weighted hours of play per week. This is wear level **5**. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance. Your maintenance level is .5 and this difference between these two means that this turf is unsustainable under these conditions.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Wilson Park	306000	52	104.0	5.00	0.50

Note on the following page the Activity Weighted Hours by Week Chart for this field. The heaviest wear on these fields takes place June through July (120 activity weighted hours per week). The yellow lines indicate the dormancy of the Bermuda grass. Again this is the reason we are recommending the Hybrid Blue grasses for all of your sites.



2. The Current Maintenance Level of these Fields

The Wear Index shows that these fields have a category **5** wear and your current maintenance level is .5. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings. The mowings would be cut in half if you follow our recommendations for using a Primo type growth regulator that uses the energy from the additional fertilizations to mend and drive roots down.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Wilson Park	0.50	5.00	34	156	0	12	0	1	0	1	0	6

3. The Soil Analysis:

The soils in this root-zone are a Loamy Sand soil with 80% sand and 20% silt and clay. The silt and clay particles are easily compacted under wear and moisture conditions. This site will require Nitrogen and a lot of potassium. Also the sodium level at this site is high enough that we are recommending the sodium blocker product to lower these salts.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.60	0.39	Hi	Loamy Sand	4.70	8.00	140	142	32	2548	337	156	9.30	57.00	3.00	1.20	1.52
RECOMMENDED	LOW	S.LOAM	3.5%+			50 PPM	453.75	15 PPM	2310.00	296.10	35 PPM	3 PPM	25 PPM	5 PPM	1.50	0.75
LBS/ 1000 SQ FT. NEEDED					6.00	0.00	4.68	0.00	0.00	0.00		0.00	0.00	0.000	0.000	0.000
								<800								

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
17	26%	2%	77%	17%	4.09%	50.00
RECOMMENDED LI	12-14				<5	<150

SAND%	SILT%	CLAY%
80.00%	12.0%	8.00%

Below is a comparison of the leaf analysis and soil analyses for these fields taken in December.

Leaf Analysis Comparison

Wilson	Total % N	Phos. % P	Pottas. % K	Calci. % Ca	Magnes. %Mg	Sulfur % S	Zinc Zn ppm	Iron Fe ppm	Mang. Mn ppm	Copper Cu ppm	Boron B ppm	Sodium % Na
Needed	2-2.8	0.3-0.6	2-4%	0.2-1.5	0.25-0.6	0.2-0.6	20-250	50-500	50-300	5-50 ppm	5-60 ppm	<0.5
12/1/2010	3.58	0.39	2.55	0.42	0.2	0.3	51	300	23	9	10	0.135
									Low			

Soil Analysis Comparison

Wilson	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Needed	5.00	50.00	200.00	1400.00	400.00	15.00	3.00	15.00	2.00	1.50	0.75	30.00
12/1/2010	8	140	142	2548	337	32	9.3	57	3	1.2	1.52	156

As is many times the case, the nutrient levels in the soils can be ok but the leaf levels can be low. In this case the copper is low in the soil but ok in the leaf. On this site the soil is showing very low in potassium and the leaf potassium level is marginal and we need to add this important nutrient. We will also need to monitor the manganese level to see if this improves after the new maintenance techniques have been applied

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to your wear level of 5, you will need to add 321 additional annual man-hours or approximately $13,054 annually in maintenance costs at this site based on your current wages & benefits if you were to do this without using a contractor. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Wilson Park	306000	52	104.0	5.00	0.50	88	409	321	$3,578	$16,631	$13,054

2. Fertilizer Costs

The 2011 fertilizer costs below are for a granule and liquid program rather than our recommended fertigation program.

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Gallons	Lbs	Potassium	LFA	Sodium	Primo	
Product	Nitrogen	Phosphorus	0-0-50	Organics	Blocker	Growth	
Formulation	30-5-10	0-45-0	0-0-50	50Lbs./Bag		Regulater	
Form	Lbs	Lbs	Lbs	Gallons	Gallons	Gallons	
Wilson Park	6120	0	1640	0	0	9	
Cost Each	0.46	0.65	0.50	16.50	16.00	316.85	
Total Cost	$2,815	$0	$820	$0	$0	$2,782	$6,418

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $19,229 it cost you in 2010 to maintain this site. This is $2,737 per acre per year. Scenario #2 shows the $44,452 in costs which is $25,223 more in additional manpower and materials for stepping up your maintenance from level .5 to level 5 if you did all of this maintenance in house. This is $6,448 per acre per year. Scenario #3 shows your 1 time annual costs of $45,294 which includes new fertigation equipment that is needed. This would be $6,448 per acre for that year. Scenario #4 shows the $31,969 in annual costs of maintaining your fields after the purchase of the new equipment. This is $4,551 per acre per year which is in the low range for high wear fields in your climate but this reflects a projected 20% reduction in water from implementing **all of the recommendations in this report.**

SCENARIO COST ANALYSIS

Wilson Park	Scenario #1 2010 Current Wear Mtn Level 0.50 No New Equipment	Scenario #2 2011 Current Wear Mtn Level 5.0 No New Equipment	Scenario #3 2011 Current Wear Mtn Level 5.0 Purchase New Equipment	Scenario #4 2012 Current Wear Mtn Level 5.0
	$2,737	$6,328	$6,448	$4,551
Square Feet	306,000	306,000	306,000	306,000
ANNUAL TOTALS:	$19,229	$44,452	$45,294	$31,969
Top dressing	$0	$5,372	$5,372	$2,686
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$4,016	$4,016	$2,008
Slit Seed- Contractor	$0	$0	$0	
Fertilizer	$0	$0	$0	$0
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Manpower	$3,578	$16,631	$11,973	$11,973
Water	$15,651	$15,651	$15,651	$12,521
Irrigation repair	$0	$0	$0	$0
Primo		$2,782	$2,782	$2,782
Field Striping	$0	$0	$0	$0
Infield Materials	$0	$0	$0	$0
	$0	$0	$0	$0
1 Fertigation System		$0	$5,500	$0

Sports Field Management System Manual

This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2010 maintenance year, this will be changed to reflect your capabilities. It currently calls for fertigation with concentrated nitrogen only and utilizing concentrated granular, lime and magnesium. It also calls for spraying the Primo product monthly during the growing season.

DATE: 12/24/10 **SQ.FT:** 306000 **Wilson Park**

APPLICATION SCHEDULE: City of Torrance

WEEK OF	30-5-10 Gallons	0-45-0 LBS	0-0-50 LBS	Sodium Blocker Gallons	Magnesium LBS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter Tine	Knife Aeration	Plug Aerate	Over Seed	Top Dress
01/08/11	0	0	0	7		0.0	3	2.0		X			
01/15/11							3	2.0					
01/22/11							3	2.0					
01/29/11							3	2.0					
02/05/11	0	0	0	7	0	0.00	3	2.0		X			
02/12/11							3	2.0					
02/19/11							3	2.0					
02/26/11							3	2.0					
03/05/11	1020	0	0	7	348	0.98	3	1.5		X			
03/12/11							3	1.5					
03/19/11							3	1.5					
03/26/11							3	1.5					
04/02/11	0	0	555	7		0.98	3	1.5		X			
04/09/11							3	1.5					
04/16/11							3	1.5					
04/23/11							3	1.5					
04/30/11	1020	0	0	7	348	0.98	3	1.5		X			
05/07/11							3	1.5					
05/14/11							3	1.5					
05/21/11							3	1.5					
05/28/11							3	1.5					
06/04/11	0	0	555	7		0.98	3	1.5	X	X	X	X	X
06/11/11							3	1.5					
06/18/11							3	1.5					
06/25/11							3	1.5					
07/02/11	1020	0	0	7	348	0.98	3	1.5		X			
07/09/11							3	1.5					
07/16/11							3	1.5					
07/23/11							3	1.5					
07/30/11							3	1.5					
08/06/11	0	0	555	7	0	0.98	3	1.5		X			
08/13/11							3	1.5					
08/20/11							3	1.5					
08/27/11							3	1.5					
09/03/11	1020	0	0	7	348	0.98	3	1.5		X			
09/10/11							3	1.5					
09/17/11							3	1.5					
09/24/11							3	1.5					
10/01/11	0	0	0	7		0.98	3	1.5		X			
10/08/11							3	1.5					
10/15/11							3	1.5					
10/22/11							3	1.5					
10/29/11	1020	0	0	7		0.98	3	1.5		X		X	
11/05/11							3	1.5					
11/12/11							3	1.5					
11/19/11							3	1.5					
11/26/11							3	1.5					
12/03/11	0		0	7		0.00	3	2.0		X			
12/10/11							3	2.0					
12/17/11							3	2.0					
12/24/11							3	2.0					
12/31/11	1020			7			3	2.0					

Nitrogen	30-5-10	5100	Gls	Magnesium	1391	Lbs
	0-45-0	0	Lbs	Primo	8.78	Gls
	0-0-50	1665	Lbs			
Sodium Blocker		91	Gls			

.5 Mowings per week= Mowing every 14 days
1 Mowing per week= Mowing every 7 days
1.5 Mowings per week = Mowing every 5 days
2 mowings per week= Mowing every 4 days
2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 4,424 activity weighted hours. Since this is soccer with a rating of 2, this is an excess of 2,212 (4424/2) actual hours per year more wear than the turf can tolerate. When you step up your maintenance level .5 to level 5, you still have 203 activity weighted hours per year or 102 excess actual hours of play annually more than your turf can tolerate.

City of Torrance

FIELD USAGE / AVAILABILITY ANALYSIS

Wilson Park — Square Ft. 306000 — **Total**

Type of Grass: — **Weeks/ YR** 52 — **Hours Average**

Cool Weather Grasses — **Weeks/ mo**

				Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
				4	5	4	4	5	4	4	5	4	4	4	4
Field Availability	**(Numbers represent activity-weighted hours per week)**														
Current Maint. Level 0.50	Hours Allowed	200	16.17	10.40	11.60	12.80	16.20	18.00	19.80	20.00	20.00	20.00	19.80	15.00	10.40
	Hours Available														
	Excess hours of usage	4424	85.07	76.28	76.08	69.11	41.33	45.92	77.38	105.18	86.28	68.68	77.26	82.18	91.78
Maint. Level 2.00	Hours Allowed	200	40.42	26.00	29.00	32.00	40.50	45.00	49.50	50.00	50.00	50.00	49.50	37.50	26.00
	Hours Available														
	Excess hours of usage	4424	85.07	60.68	58.68	49.91	17.03	18.92	47.68	75.18	56.28	38.68	47.56	59.68	76.18
Maint. Level 3.00	Hours Allowed	3640	56.58	36.40	40.60	44.80	56.70	63.00	69.30	70.00	70.00	70.00	69.30	52.50	36.40
	Hours Available														
	Excess hours of usage	984	18.92	50.28	47.08	37.11	0.83	0.92	27.88	55.18	36.28	18.68	27.76	44.68	65.78
Maint. Level 4.00	Hours Allowed	4160	64.67	41.60	46.40	51.20	64.80	72.00	79.20	80.00	80.00	80.00	79.20	60.00	41.60
	Hours Available						7.27	8.08							
	Excess hours of usage	464	8.92	45.08	41.28	30.71			17.98	45.18	26.28	8.68	17.86	37.18	60.58
Maint. Level 5.00	Hours Allowed	4421	68.71	44.20	49.30	54.40	68.85	76.50	84.15	85.00	85.00	85.00	84.15	63.75	44.20
	Hours Available						11.32	12.58							
	Excess hours of usage	203	3.90	42.48	38.38	27.51			13.03	40.18	21.28	3.68	12.91	33.43	57.98

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	5.0
Mowings/ Yr	34	156
Aerations/Yr	0	12
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	12
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$19,229	$44,452
Ann. Increase		$25,224
Cost/month	$371	$857
Cost/week	$93	$214

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practice	**2.00**
Adult Soccer & Football G	**2.13**
Adult Soccer & Football P	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tournam	**2.50**
Current Wear Level	**5.00**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**5.0**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

.On the chart on the following page, if you can set aside these fields in June & July this would keep you from going over these hours and would actually give you 7 additional activity weighted hours per year.

City of Torrance

FIELD USAGE / AVAILABILITY ANALYSIS

Wilson Park — Square Ft. 306000 — **Total**

Type of Grass: Cool Weather Grasses — **Weeks/ YR** 44 — **Weeks/ mo**

		Hours Average	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
			4	5	4	4	5	4	4	5	4	4	4	4
Field Availability	**(Numbers represent activity-weighted hours per week)**													
Current Maint. Level 0.50	Hours Allowed	200	16.17	10.40	11.60	12.80	16.20	18.00	19.80	20.00	20.00	20.00	19.80	15.00	10.40
	Hours Available								19.80	20.00					
	Excess hours of usage	3534	80.32	76.28	76.08	69.11	41.33	45.92			86.28	68.68	77.26	82.18	91.78
Maint. Level 2.00	Hours Allowed	200	40.42	26.00	29.00	32.00	40.50	45.00	49.50	50.00	50.00	50.00	49.50	37.50	26.00
	Hours Available								49.50	50.00					
	Excess hours of usage	3534	80.32	60.68	58.68	49.91	17.03	18.92			56.28	38.68	47.56	59.68	76.18
Maint. Level 3.00	Hours Allowed	3080	56.58	36.40	40.60	44.80	56.70	63.00	69.30	70.00	70.00	70.00	69.30	52.50	36.40
	Hours Available								69.30	70.00					
	Excess hours of usage	654	14.87	50.28	47.08	37.11	0.83	0.92			36.28	18.68	27.76	44.68	65.78
Maint. Level 4.00	Hours Allowed	3520	64.67	41.60	46.40	51.20	64.80	72.00	79.20	80.00	80.00	80.00	79.20	60.00	41.60
	Hours Available						7.27	8.08	79.20	80.00					
	Excess hours of usage	214	4.87	45.08	41.28	30.71					26.28	8.68	17.86	37.18	60.58
Maint. Level 5.00	Hours Allowed	3741	68.71	44.20	49.30	54.40	68.85	76.50	84.15	85.00	85.00	85.00	84.15	63.75	44.20
	Hours Available	7					11.32	12.58	84.15	85.00					
	Excess hours of usage			42.48	38.38	27.51					21.28	3.68	12.91	33.43	57.98

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	4.5
Mowings/ Yr	34	132
Aerations/Yr	0	12
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	12
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$19,229	$42,420
Ann. Increase		$23,192
Cost/month	$371	$818
Cost/week	$93	$205

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practice	**2.00**
Adult Soccer & Football G	**2.13**
Adult Soccer & Football Pr	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tournam	**2.50**
Current Wear Level	**4.50**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**4.5**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
McMaster Park Field

Current Conditions of the field

The 2.5” root depth is too shallow to stand up to the wear it is currently receiving. This is reflected in the worn and bare spots. The irrigation system is Ok but the grades are poor as reflected in the high and low spots.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Mc Master Park	2.50	Poor	50%	60%	60%	Ok	20%	X	

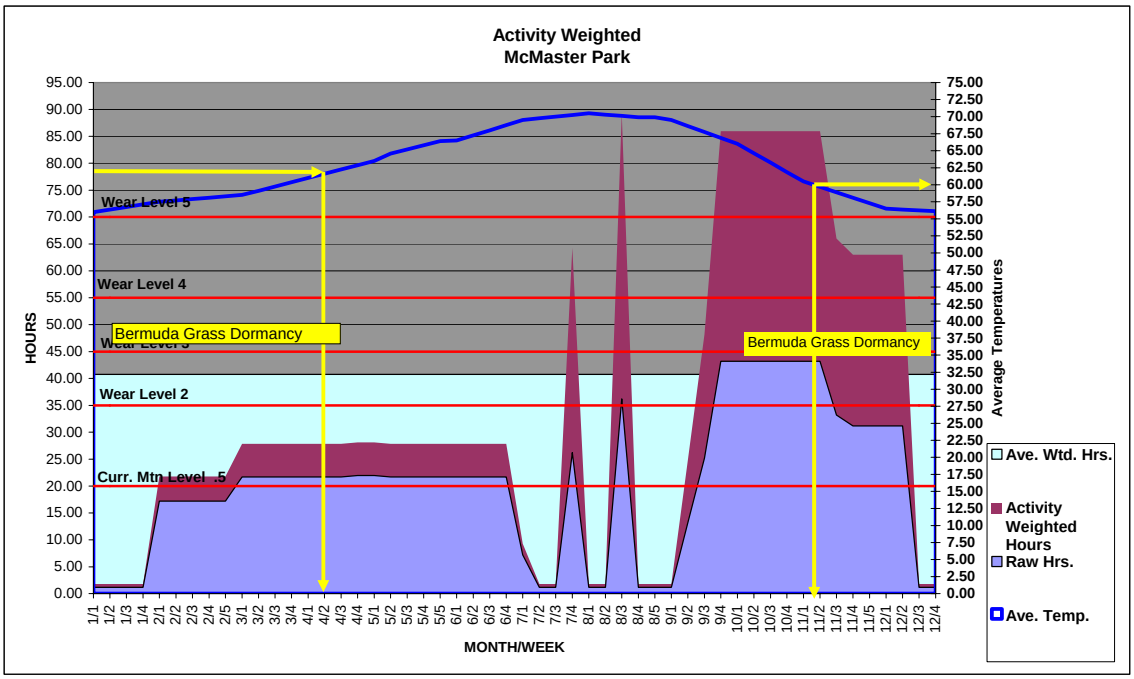
The Causes of the Current Conditions

1. Wear has led to many of the current problems on this field.
Your wear is probably the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index in Hours Per Week table below shows that this field has **40.7**activity-weighted hours of play per week. This is wear level **1.5**. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Mc Master Park	89676	52	40.7	1.50	0.50

Note on the following page the Activity Weighted Hours by Week Chart for this site. The heaviest wear here takes place September through October (85 activity weighted hours per week). The yellow lines indicate the dormancy of the Bermuda grass. You still have some play during dormancy and again this is why we are recommending the Hybrid Blue grasses.



2. The Current Maintenance Level of the Site

The Wear Index shows that this field has a category 1.**5** wear and your current maintenance level is .5. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Mc Master Park	0.50	1.50	26	52	0	12	0	0	0	1	0	6

3. The Soil Analysis:

The soils in this root-zone are a Sandy Loam soil with 68% sand and 32% silt and clay. The silt and clay particles are easily compacted under wear and moisture conditions. Also the reclaimed water has elevated the sodium level in the soil to the point that we must take steps at this time to correct it.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.40	1.12	Hi	Sandy Loam	6.30	35.00	200	445	66	3424	490	414	21.30	36.00	3.00	2.00	3.15
RECOMMENDED LEVELS		LOW	S.LOAM	3.5%+		50 PPM	212.00	15 PPM	1300 PPM	200 PPM	35 PPM	3 PPM	25 PPM	3 PPM	1.50	0.75
LBS/ 1000 SQ FT. NEEDED					3.25	0.00	2.34	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
								<800								

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
25	10%	5%	68%	16%	7%	260.0
12-14					<5	<150

SAND%	SILT%	CLAY%
68.00%	19.00%	13.00%

Below is a comparison of the leaf analysis and soil analyses for this site.

Leaf Analysis Comparison

McMaster	Total % N	Phos. % P	Pottas. % K	Calci. % Ca	Magnes. %Mg	Sulfur % S	Zinc Zn ppm	Iron Fe ppm	Mang. Mn ppm	Copper Cu ppm	Boron B ppm	Sodium % Na
Needed	**2-2.8**	**0.3-0.6**	**2-4%**	**0.2-1.5**	**0.25-0.6**	**0.2-0.6**	**20-250**	**50-500**	**50-300**	**5-50 ppm**	**5-60 ppm**	**<0.5**
12/1/2010	4.45	0.44	3.23	0.48	0.26	0.36	82.00	429.00	52.00	15.00	14.00	0.29

Soil Analysis Comparison

McMaster	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Needed	**5.00**	**50.00**	200.00	1400.00	400.00	**15.00**	**3.00**	**15.00**	**2.00**	**1.50**	**0.75**	30.00
12/1/2010	35	200	445	3424	490	66	21.3	36	3	2	3.15	414

At this site the levels are adequate in the soils and the leaf but you will still need nitrogen.

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that you are at maintenance level .5 and your wear level is 1.5. You will need to add 44 additional annual man-hours or approximately $1,797 annually in maintenance costs on this site based on your current wages & benefits if you were to do this in house. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Mc Master Park	89676	52	40.7	1.50	0.50	59	103	44	$2,382	$4,179	$1,797

2. Fertilizer Costs

The 2011 recommended fertilization will cost approximately $892 for this site.

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Gallons	Lbs	Potassium	LFA	Sodium	
Product	**Nitrogen**	**Phosphorus**	**0-0-50**	**Organics**	**Blocker**	
Formulation	**30-5-10**	**0-45-0**	**0-0-50**	**50Lbs./Bag**		
Form	**Lbs**	**Lbs**	**0.00**	**0.00**	**0.00**	
Mc Master Park	**971**	**0**	**152**	**0**	**23**	
Cost Each	**0.46**	**0.65**	**0.50**	**16.50**	**16.00**	
Total Cost	**$447**	**$0**	**$76**	**$0**	**$369**	**$892**

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $6,735 it costs you in 2010 to maintain this site. This is $3,271 per acre per year. Scenario #2 shows the $11,369 in costs which is $4,634 more in additional manpower and materials for your new maintenance level of 1.5. This is $5,523 per acre per year. Scenario #3 shows your $14,017 1 time only annual cost including new fertigation equipment that is needed. This is $6,809 per acre for that year only. Scenario #4 shows the $9,553 in annual costs of maintaining this site after the purchase of the new equipment and the expected **20% reduction in water costs because of the implementation of all the recommendations**. This is $4,641 per acre per year which is in the low range for high wear fields in your climate.

SCENARIO COST ANALYSIS

Mc Master Park	**Scenario #1 2009 Current Wear Mtn Level 0.50 No New Equipment**	**Scenario #2 2009 Current Wear Mtn Level 1.5 No New Equipment**	**Scenario #3 2010 Current Wear Mtn Level 1.5 Purchase New Equipment**	**Scenario #4 2010 Current Wear Mtn Level 1.5**
	$3,271	$5,523	$6,809	$4,641
Square Feet	89,676	89,676	89,676	89,676
ANNUAL TOTALS:	$6,735	$11,369	$14,017	$9,553
Top dressing	$0	$1,661	$1,661	$830
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$1,177	$1,177	$1,177
Slit Seed- Contractor	$0	$0	$0	
Fertilizer	$0	$0	$0	$0
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Manpower	$2,382	$4,179	$4,064	$4,064
Water	$4,353	$4,353	$4,353	$3,483
Irrigation repair	$0	$0	$0	$0
Primo			$0	$0
Field Striping	$0	$0	$0	$0
Infield Materials	$0	$0	$0	$0
Out Sourcing	$0	$0	$0	$0
1 Fertigation System			$2,763	$0

Sports Field Management System Manual

This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to

reflect your capabilities. It currently calls for fertigation with concentrated nitrogen only and utilizing concentrated granular, phosphorus, potassium, lime and magnesium.

DATE: 12/24/10 **SQ.FT:** 89676 **Mc Master Park**

APPLICATION SCHEDULE: **City of Torrance**

WEEK OF	30-5-10 LBS.	0-45-0 LBS	0-0-50 LBS	Sodium Blocker GLS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter Tine	Knife Aerate	PLUG Aerate	OVER SEED	TOP DRESS
01/01/11	0	0	0	2	0	1	1.0		X			
01/08/11						1	1.0					
01/15/11						1	1.0					
01/22/11						1	1.0					
01/29/11	162	0	0	2	0.00	1	1.0		X			
02/05/11						1	1.0					
02/12/11						1	1.0			`		
02/19/11						1	1.0					
02/26/11	0	0	152	2	0.00	1	1.0		X			
03/05/11						1	1.0					
03/12/11						1	1.0					
03/19/11						1	1.0					
03/26/11	162	0	0	2	0.00	1	1.0		X			
04/02/11						1	1.0					
04/09/11						1	1.0					
04/16/11						1	1.0					
04/23/11	0	0	0	2	0.00	1	1.0		X			
04/30/11						1	1.0					
05/07/11						1	1.0					
05/14/11						1	1.0					
05/21/11						1	1.0					
05/28/11	162	0	0	2	0.00	1	1.0	X	X	X	X	X
06/04/11						1	1.0					
06/11/11						1	1.0					
06/18/11						1	1.0					
06/25/11	0	0	0	2	0.00	1	1.0		X			
07/02/11						1	1.0					
07/09/11						1	1.0					
07/16/11						1	1.0					
07/23/11						1	1.0					
07/30/11	162	0	0	2	0.00	1	1.0		X			
08/06/11						1	1.0					
08/13/11						1	1.0					
08/20/11						1	1.0					
08/27/11	0	0	0	2	0.00	1	1.0		X			
09/03/11						1	1.0					
09/10/11						1	1.0					
09/17/11						1	1.0					
09/24/11	162	0	0	2	0.00	1	1.0		X			
10/01/11						1	1.0					
10/08/11						1	1.0					
10/15/11						1	1.0					
10/22/11	0	0	0	2	0.00	1	1.0		X			
10/29/11						1	1.0					
11/05/11						1	1.0					
11/12/11						1	1.0					
11/19/11						1	1.0					
11/26/11	162	0	0	2	0.00	1	1.0		X			
12/03/11						1	1.0					
12/10/11						1	1.0					
12/17/11						1	1.0					
12/24/11						1	1.0					

Nitrogen	30-5-10	971	gls		.5 Mowings per week= Mowing every 14 days
	0-45-0	0	lbs	Primo	0.00 1 Mowing per week= Mowing every 7 days
	0-0-50	152	lbs		1.5 Mowings per week = Mowing every 5 days
Sodium Blocker		23.07	gls		2 mowings per week= Mowing every 4 days
					2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 898activity weighted hours. If this is soccer with a rating of 2, this is an excess of 449 (898 / 2) actual hours per year more than the turf can tolerate. By increasing the maintenance level at this site to 2, you will actually have additional hours of play available to you at this site and still have sustainable turf.

City of Torrance

FIELD USAGE / AVAILABILITY ANALYSIS

Mc Master Park — Square Ft. 89676 — **Total**

Type of Grass: — **Weeks/ YR** 52 — **Hours** — **Average**

K BLUE GRASS — **Weeks/ mo**

				Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
				4	5	4	4	5	4	4	5	4	4	4	4
Current Actual Hours on the Field /Wk		989	19	1.2	17.2	21.69	21.75	21.74	21.69	8.94	8.19	20.69	43.19	30.12	19.19
Current Activity Weighted Hours Hrs/Wk		1723	33.14	1.8	21.8	27.86	27.92	27.91	27.86	19.29	19.29	40.19	85.99	75.24	38.51
Current Wear Level/ Needed Maint. Level-			1.50	1.00	1.00	1.50	1.50	1.50	1.50	1.00	1.00	2.50	5.00	5.00	2.00
Turfgrass Recovery Index-% of Healing				52%	58%	64%	81%	90%	99%	100%	100%	100%	99%	75%	52%
Field Availability	**(Numbers represent activity-weighted hours per week)**														
Current Maint. Level 0.50	Hours Allowed	826	16.17	10.40	11.60	12.80	16.20	18.00	19.80	20.00	20.00	20.00	19.80	15.00	10.40
	Hours Available			8.62						0.72	0.72				
	Excess hours of usage	898	17.27		10.19	15.06	11.72	9.91	8.06			20.19	66.19	60.24	28.11
Maint. Level 2.00	Hours Allowed	1445	28.29	18.20	20.30	22.40	28.35	31.50	34.65	35.00	35.00	35.00	34.65	26.25	18.20
	Hours Available			16.42			0.43	3.59	6.79	15.72	15.72				
	Excess hours of usage	279	5.36		1.49	5.46						5.19	51.34	48.99	20.31
Maint. Level 3.00	Hours Allowed	1858	36.38	23.40	26.10	28.80	36.45	40.50	44.55	45.00	45.00	45.00	44.55	33.75	23.40
	Hours Available	134	2.58	21.62	4.32	0.94	8.53	12.59	16.69	25.72	25.72	4.82			
	Excess hours of usage												41.44	41.49	15.11
Maint. Level 4.00	Hours Allowed	2270	44.46	28.60	31.90	35.20	44.55	49.50	54.45	55.00	55.00	55.00	54.45	41.25	28.60
	Hours Available	547		26.82	10.12	7.34	16.63	21.59	26.59	35.72	35.72	14.82			
	Excess hours of usage												31.54	33.99	9.90
Maint. Level 5.00	Hours Allowed	2890	56.58	36.40	40.60	44.80	56.70	63.00	69.30	70.00	70.00	70.00	69.30	52.50	36.40
	Hours Available	1166	22.43	34.62	18.82	16.94	28.78	35.09	41.44	50.72	50.72	29.82			
	Excess hours of usage												16.69	22.74	2.11

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	1.5
Mowings/ Yr	26	52
Aerations/Yr	0	6
Top Dress/Yr	0	0
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$6,735	$11,369
Ann. Increase		$4,635
Cost/month	$130	$219
Cost/week	$32	$55

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practice	**2.00**
Adult Soccer & Football G	**2.13**
Adult Soccer & Football Pı	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tournam	**2.50**
Current Wear Level	**1.50**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**1.5**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

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We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
El Nido Fields

Current Conditions of the Site

The 2" root depth of this field means the root zone is too shallow for this site to stand up to the wear it is currently receiving. The irrigation system is Ok but the grades are very poor and the worst that we saw at any of your sites. This site is one that needs to be completely amended properly, re-graded and set aside for the season to grow in.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
El Nido Park	2.00	V Poor	10%	40%		Ok		X	

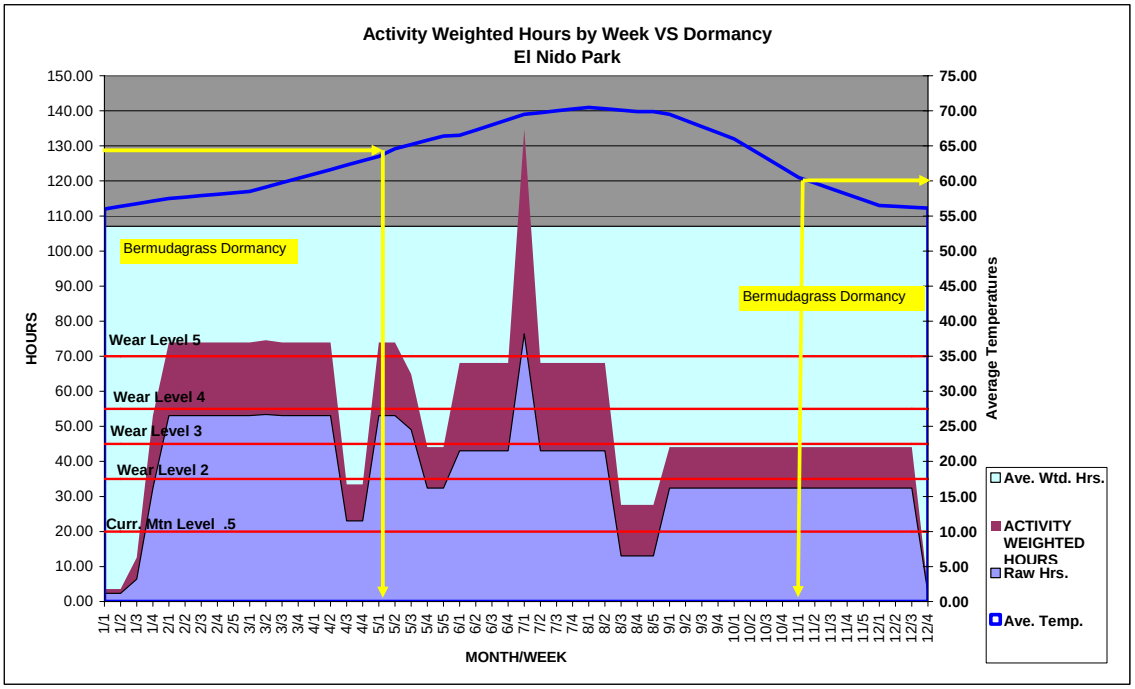
The Causes of the Current Conditions

1. Wear has led to all the current problems on this field.
Wear is the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that this field has **107** activity-weighted hours of play per week. This is wear level **5** but the maintenance level is .5. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance. The turf here is unsustainable with this much difference.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
El Nido Park	83980	52	107.1	5.00	0.50

Note on the following page the Activity Weighted Hours by Week Chart for the soccer field. The heaviest wear on this field takes place in July (130 activity weighted hours per week). The yellow lines indicate the dormancy of the Bermuda grass and the play that you have during this dormancy period is the reason we are recommending the Hybrid Blue grasses. It would actually be better if this field could be shut down completely from 6/1/-7/31 or even 5/1-7/1 each year for healing.



2. The Current Maintenance Level of this Site

The Wear Index shows that this site has a category **5** wear and your current maintenance level is .5. Again this equals unsustainable turf.

Note that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings. The mowings would be cut in half if you follow our recommendations for using a Primo type growth regulator that uses the energy from the additional fertilizations to mend and drive roots down.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
El Nido Park	0.50	5.00	26	119	0	12	0	1	0	1	0	6

3. The Soil Analysis:

The soils in the root-zone of this field are a Loamy Sand soil with 80% sand and 20% silt and clay. The percolation rate for soils with this high of sand % is very good but the 20% of fine silt and clay particles will still allow this site to be compacted under wear and moisture conditions. This site mainly needs nitrogen and potassium.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.30	0.66	Low	Loamy Sand	4.50	6.00	104	150	69	2410	317	207	18.60	52.00	3.00	1.70	1.37
RECOMMENDED L	LOW	S.LOAM		3.5%+		50 PPM	212.00	12 PPM	1300 PPM	135 PPM	35 PPM	.5 PPM	15 PPM	2 PPM	.4 PPM	<1
LBS/ 1000 SQ FT. NEEDED					6.00	0.00	1.50	0.00	0.00	0.00		0.00	0.00	0.00	0.00	

<800

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
16	0%	2%	75%	17%	6%	150
RECOMMENDED LEV 12-14					<5	<150

SAND%	SILT%	CLAY%
80.00%	12.00%	8.00%

Below is a comparison of the leaf analysis and soil analysis for this site. They are both showing low potassium levels.

Leaf Analysis Comparison

	Total % N	Phos. % P	Pottas. % K	Calci. % Ca	Magn. %Mg	Sulfur % S	Zinc Zn ppm	Iron Fe ppm	Mang. Mn ppm	Copper Cu ppm	Boron B ppm	Sodium % Na
El Nido	**3.4-4.5**	**0.35-0.8**	**3-4%**	**0.4-1.25**	**0.25-0.6**	**0.25-0.6**	**20-65**	**80-250**	**50-200**	**9-20 ppm**	**10-50 ppm**	**0.01-.250**
12/1/2010	3.3	0.48	2.79	0.64	0.26	0.28	65	195	36	8	14	0.179
			Low									

Soil Analysis Comparison

El Nido	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Neede	**5.00**	**50.00**	**200.00**	**1400.00**	**300.00**	**15.00**	**3.00**	**15.00**	**2.00**	**1.50**	**0.75**	**30.00**
12/1/2010	6.00	101.00	150.00	2410.00	317.00	69.00	18.60	44.80	3.00	0.80	1.37	207.00

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to your wear level of 5, you will add 161 additional annual man-hours or approximately $6,537 annually in maintenance costs on this field based on your current wages & benefits if you were to do this in house. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
El Nido Park	83980	52	107.1	5.00	0.50	57	223	166	$2,309	$9,056	$6,747

2. Fertilizer Costs

The 2011 fertilization will cost approximately $2,133. This is with a granule / liquid program rather than the fertigation program we are recommending which would actually cost less annually.

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Gallons	Lbs	Potassium	Sodium	Primo	Con. Organic	
Product	Nitrogen	Phosphorus	0-0-50	Blocker		Growth Med.	
Formulation	30-5-10	0-45-0	0-0-50				
Form	Lbs	Lbs.	Lbs	Gallons	Gallons	Lbs	
El Nido Park	1680	0	0	0	4	0	
Cost Each	0.46	0.65	0.50	16.50	316.85	0.70	
Total Cost	$773	$0	$0	$0	$1,361	$0	$2,133

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $7,692 it costs you annually to maintain this site. This is $3,990 per acre per year. Scenario #2 shows the $18,940 in costs which is $11,248 more in additional manpower and materials for stepping up your maintenance from level .5 to level 5. This is $9,824 per acre per year. Scenario #3 shows your 1 time annual cost which includes the new equipment that is needed. This would be $10,763 per acre per year that year. Scenario #4 shows the $14,135 in annual costs of maintaining your fields after the purchase of the new equipment. Scenario #4 includes expected water savings of 20% from implementing all of the recommendations from this assessment. This is $7,332 per acre per year which is in the mid range for high wear fields in your climate.

SCENARIO COST ANALYSIS

El Nido Park		**Scenario #1 2010 Current Wear Mtn Level 0.50 No New Equipment**	**Scenario #2 2011 Current Wear Mtn Level 5.0 No New Equipment**	**Scenario #3 2011 Current Wear Mtn Level 5.0 Purchase New Equipment**	**Scenario #4 2012 Current Wear Mtn Level 5.0**
		$3,990	$9,824	$10,763	$7,332
	Square Feet	83,980	83,980	83,980	83,980
	ANNUAL TOTALS:	$7,692	$18,940	$20,750	$14,135
Top dressing		$0	$1,474	$1,474	$737
Spread top dressing-Contractor		$0	$0	$0	$0
Grass Seed		$0	$1,102	$1,102	$551
Slit Seed- Contractor		$0	$0	$0	
Fertilizer		$0	$2,133	$1,085	$1,085
Deeptine aeration- Contractor		$0	$0	$0	$0
Contractor Mobilization		$0	$0	$0	$0
Manpower		$2,309	$8,846	$6,166	$6,166
Water costs		$5,384	$5,384	$5,384	$4,307
Irrigation Materials		$0	$0	$0	$0
Primo			$0	$1,288	$1,288
Fertigation				$4,250	

Sports Field Management System Manual

This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to reflect your capabilities. It currently calls for a granule / liquid program rather than the fertigation program we are recommending. It also calls for spraying the Primo product and Sodium Blocker monthly during the growing season.

DATE: 12/29/10 **SQ.FT:** 83980 **El Nido Park**

APPLICATION SCHEDULE: **City of Torrance**

WEEK OF	30-5-10 LBS	11-52-0 LBS	0-0-50 LBS	S. Blocker GALS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Fracture Tine	Knife Aerate	Plug Aerate	Over Seed	Top Dress
01/01/11	0	0	0	2		1	1.0		X			
01/08/11						1	1.0					
01/15/11						1	1.0					
01/22/11						1	1.0					
01/29/11	280	0	0	2	0.39	3	1.5		X			
02/05/11						3	1.5					
02/12/11						3	1.5					
02/19/11						3	1.5					
02/26/11	0	0	0	2	0.39	3	1.5		X			
03/05/11						3	1.5					
03/12/11						3	1.5					
03/19/11						3	1.5					
03/26/11	280	0	0	2	0.39	3	1.5		X			
04/02/11						3	1.5					
04/09/11						3	1.5					
04/16/11						3	1.5					
04/23/11	0	0	0	2	0.39	3	1.5		X			
04/30/11						3	1.5					
05/07/11						3	1.5					
05/14/11						3	1.5					
05/21/11						3	1.5					
05/28/11	280	0	0	2	0.39	3	1.5	X	X	X	X	X
06/04/11						3	1.5					
06/11/11						3	1.5					
06/18/11						3	1.5					
06/25/11	0	0	0	2	0.39	3	1.5		X			
07/02/11						3	1.5					
07/09/11						3	1.5					
07/16/11						3	1.5					
07/23/11						3	1.5					
07/30/11	280	0	0	2	0.39	3	1.5		X			
08/06/11						1	1.0					
08/13/11						1	1.0					
08/20/11						1	1.0					
08/27/11	0	0	0	2	0.39	1	1.0		X			
09/03/11						2	1.0					
09/10/11						2	1.0					
09/17/11						2	1.0					
09/24/11	280	0	0	2	0.39	2	1.0		X			
10/01/11						2	1.0					
10/08/11						2	1.0					
10/15/11						2	1.0					
10/22/11	0	0	0	2	0	2	2.0		X			
10/29/11						2	2.0					
11/05/11						2	2.0					
11/12/11						2	2.0					
11/19/11						2	2.0					
11/26/11	280	0	0	2	0	2	2.0		X			
12/03/11						1	1.0					
12/10/11						1	1.0					
12/17/11						1	1.0					
12/24/11						1	1.0					

Nitrogen	30-5-10	1680	lbs
	11-52-0	0	lbs
	0-0-50	0	lbs
Primo		3.52	gls
Sodium Blocker		23.07	gls

.5 Mowings per week= Mowing every 14 days
1 Mowing per week= Mowing every 7 days
1.5 Mowings per week = Mowing every 5 days
2 mowings per week= Mowing every 4 day
2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that for the soccer field at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 1955 activity weighted hours. If this is soccer with a rating of 2, this is an excess of 977 actual hours per year more than the turf can tolerate. When you step up your maintenance level .5 to level 5, you could actually have 96 activity weighted hours or 48 actual more annual hours per year of play

City of Torrance Square Ft. 83980

FIELD USAGE / AVAILABILITY ANALYSIS

El Nido Park

Type of Grass:	Weeks/ YR 52	Total Hours	Average	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
K BLUE GRASS	Weeks/ mo			4	5	4	4	5	4	4	5	4	4	4	4
Current Actual Hours on the Field /Wk		1852	36	10.9	53.0	53.12	38.04	43.97	43.04	51.37	25.04	32.37	32.37	22.89	26.37
Current Activity Weighted Hours Hrs/W		2776	53.38	23.1	73.9	74.06	53.64	60.16	68.06	84.73	43.76	44.06	44.06	44.06	35.96
Current Wear Level/ Needed Maint. Level-			4.50	1.00	5.00	5.00	3.50	4.00	4.50	5.00	2.50	2.50	2.50	2.50	2.00
Turfgrass Recovery Index-% of Healing				52%	58%	64%	81%	90%	99%	99%	97%	99%	99%	75%	52%
Field Availability	**(Numbers represent activity-weighted hours per week)**														
Current Maint. Level 0.50	Hours Allowed	821	16.08	10.40	11.60	12.80	16.20	18.00	19.80	19.80	19.40	19.80	19.80	15.00	10.40
	Hours Available														
	Excess hours of usage	1955	37.59	12.66	62.29	61.26	37.44	42.16	48.26	64.93	24.36	24.26	24.26	29.06	25.56
Maint. Level 2.00	Hours Allowed	1437	28.15	18.20	20.30	22.40	28.35	31.50	34.65	34.65	33.95	34.65	34.65	26.25	18.20
	Hours Available														
	Excess hours of usage	1339	25.75	4.86	53.59	51.66	25.29	28.66	33.41	50.08	9.81	9.41	9.41	17.81	17.76
Maint. Level 3.00	Hours Allowed	1847	36.19	23.40	26.10	28.80	36.45	40.50	44.55	44.55	43.65	44.55	44.55	33.75	23.40
	Hours Available			0.34								0.49	0.49		
	Excess hours of usage	929	17.86		47.79	45.26	17.19	19.66	23.51	40.18	0.11			10.31	12.56
Maint. Level 4.00	Hours Allowed	2258	44.23	28.60	31.90	35.20	44.55	49.50	54.45	54.45	53.35	54.45	54.45	41.25	28.60
	Hours Available			5.54							9.59	10.39	10.39		
	Excess hours of usage	518	9.96		41.99	38.86	9.09	10.66	13.61	30.28				2.81	7.36
Maint. Level 5.00	Hours Allowed	2874	56.29	36.40	40.60	44.80	56.70	63.00	69.30	69.30	67.90	69.30	69.30	52.50	36.40
	Hours Available	98		13.34			3.06	2.84	1.24		24.14	25.24	25.24	8.44	0.44
	Excess hours of usage				33.29	29.26				15.43					

Maintenance Frequencies-Annual Requirement

Maint. Level	Current 0.50	Needed 5.0
Mowings/ Yr	26	119
Aerations/Yr	0	7
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$7,692	$19,149
Ann. Increase		$11,457
Cost/month	$148	$369
Cost/week	$37	$92

Activity Weighting Scale

Walking on field/Softball	1.00
Baseball	1.25
PE	1.50
Parked Cars	1.50
Marching Band	1.75
Soccer Games	1.85
Football Games	1.85
Soccer & Football Practice	2.00
Adult Soccer & Football G	2.13
Adult Soccer & Football P	2.25
Lacrosse & Field Hockey	2.25
Rugby	2.50
Sports Clinics & Tournam	2.50
Current Wear Level	4.50
Current Maintenance Level	0.50
Needed Maint. Level-Weather Adjusted	5.0

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

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We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
Torrance Park Field

Current Conditions of the site

The 3" root depth is too shallow to stand up to the wear it is currently receiving. This is reflected in the worn and bare spots. The irrigation system has low pressure and the grades are only fair. There are bare spots and worn spots.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Torrance Park	3.00	Fair	40%		50%	L Pressure	30%	X	

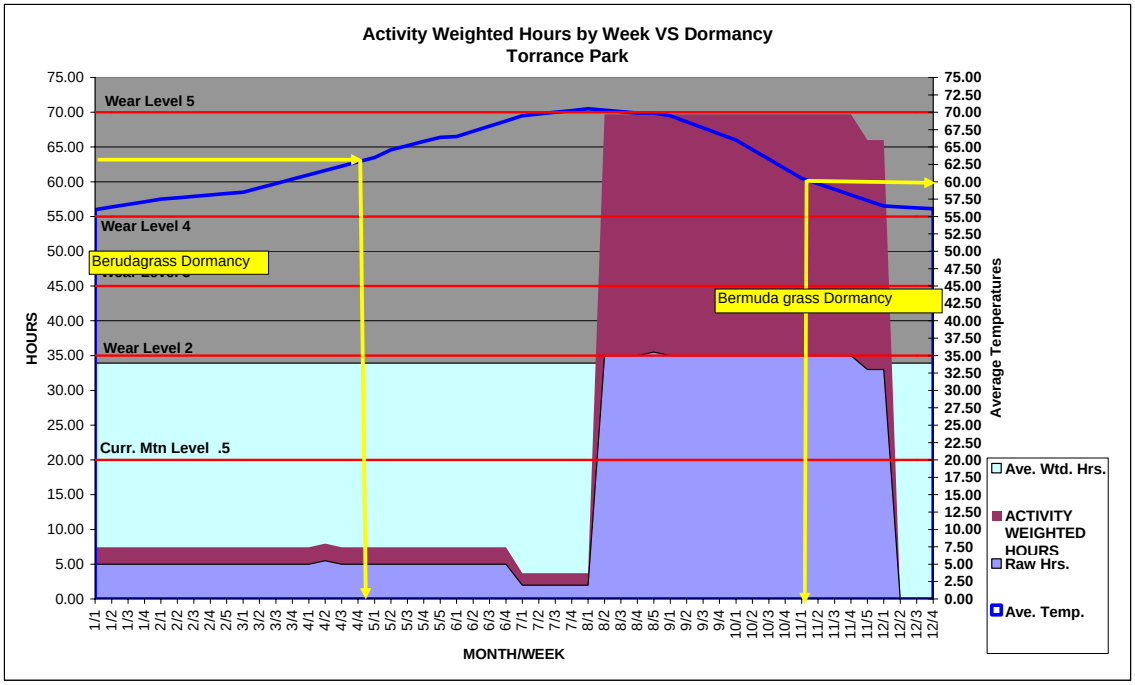
The Causes of the Current Conditions

1. Wear has led to many of the current problems on this field.
Your wear is probably the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that this field has **33.9** activity-weighted hours of play per week. Your maintenance level on this site is .5 and the wear level is **2**. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Torrance Park	56680	52	33.9	2.00	0.50

Note on the following page the Activity Weighted Hours by Week Chart for this field. The heaviest wear on this field takes place August through November (70+ activity weighted hours per week). The yellow lines indicate the dormancy of Bermuda grass. You still have some play during dormancy in December and January through April and this is the main reason we are recommending the Hybrid Kentucky Blue grasses for all of your sites.



2. The Current Maintenance Level of the Field

The Wear Index shows this field has a category **2** wear and your current maintenance level is 2.0. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings. The mowings would be cut in half if you follow our recommendations for using a Primo type growth regulator that allows the turf plant to uses the energy from the additional fertilizations to mend and drive roots down.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Torrance Park	0.50	2.00	26	92	0	12	0	0	0	1	0	6

3. The Soil Analysis:

The soils in this root-zone are a Loamy Sand with 20% silt and clay particles. These silt and clay particles will still compact under heavy wear and moisture conditions.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.30	0.27	No	Loamy Sand	5.90	5.00	310	118	23	2049	354	146	80.70	96.00	3.00	6.80	1.21
RECOMMENDED		LOW	S.LOAM	3.5%+		50 PPM	212.00	12 PPM	1300 PPM	135 PPM	35 PPM	.5 PPM	15 PPM	2 PPM	.4 PPM	<1
LBS/ 1000 SQ FT. NEEDED					3.00	0.00	2.60	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
								<800								

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
15	13%	2%	68%	19%	4%	50.00
RECOMMENDED LEVE 12-14					<5	<150

SAND%	SILT%	CLAY%
80.00%	12.00%	8.00%

Below is a comparison of the leaf analysis and the soil analysis for this site. The soils are showing low on potassium and magnesium with adequate levels for the other soil parameters. The leaf is showing low levels of magnesium and manganese as well.

Leaf Analysis Comparison

Torrance	Total % N	Phos. % P	Pottas. % K	Calci. % Ca	Magnes. %Mg	Sulfur % S	Zinc Zn ppm	Iron Fe ppm	Mang. Mn ppm	Copper Cu ppm	Boron B ppm	Sodium % Na
Needed	2-2.8	0.3-0.6	2-4%	0.2-1.5	0.25-0.6	0.2-0.6	20-250	50-500	50-300	5-50 ppm	5-60 ppm	<0.5
12/1/2010	4.02	0.49	3.09	0.49	0.23	0.34	83.00	306.00	19.00	10.00	9.00	0.13
					Low				Low			

Soil Analysis Comparison

Torrance	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Needed	5.00	50.00	200.00	1400.00	400.00	15.00	3.00	15.00	2.00	1.50	0.75	30.00
12/1/2010	5	310	118	2049	354	23	80.7	96	3	6.8	1.21	146
			Low		Low							

All of the nutrients except iron went up even though ample amounts were added. This would indicate little uptake into the plants. A leaf analysis along with the soil analysis would tell us how much is being taken up.

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to your wear level of 2, you will add 74 additional annual man-hours or approximately $3,068 annually in maintenance costs on this field based on your current wages & benefits if you do this in house. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Torrance Park	56680	52	33.9	2.00	0.50	44	120	76	$1,802	$4,871	$3,068

2. Fertilizer Costs

The 2011 fertilizer costs are shown below. These costs are for the granular /liquid program rather than the fertigation program we are recommending.

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Nitrogen	Phosphorus	Potassium	LFA	Sodium	Primo	
Product				Organics	Blocker	Growth Reg	
Formulation	30-5-10	0-45-0	0-0-50				
Form	Lbs	Lbs.	Lbs	Gallons	Gallons	Gls	
Torrance Park	567	0	147	0	0	3	
Cost Each	0.46	0.65	0.50	16.50	199.64	316.85	
Total Cost	$261	$0	$74	$0	$0	$918	$1,253

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $4,353 it costs you annually to maintain this site. This is $3,346 per acre per year. Scenario #2 shows the $9,976 in costs which is $6,630 more in additional manpower and materials for stepping up your maintenance from level .5 to level 2. This is $7,667 per acre per year. Scenario #3 shows your annual 1 time cost of $14,932 which includes new equipment that is needed. This is $11,475 per acre for that year. Scenario #4 shows the $9,299 in annual costs of maintaining this site after the purchase of the new equipment. This is $7,147 per acre per year which is in the mid range for medium wear fields in your climate. **A 20% water savings will be realized from implementing all the ideas in this assessment.**

SCENARIO COST ANALYSIS

Torrance Park	Scenario #1 2010 Current Wear Mtn Level 0.50 No New Equipment	Scenario #2 2011 Current Wear Mtn Level 2.00 No New Equipment	Scenario #3 2011 Current Wear Mtn Level 2.00 Purchase New Equipment	Scenario #4 2012 Current Wear Mtn Level 2.00
	$3,346	$7,667	$11,475	$7,147
Square Feet	56,680	56,680	56,680	56,680
ANNUAL TOTALS:	$4,353	$9,976	$14,932	$9,299
Top dressing	$0	$995	$995	$497
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$744	$744	$372
Slit Seed- Contractor	$0	$0	$0	$0
Fertilizer	$0	$334	$311	$311
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Water Costs	$2,551	$2,551	$2,551	$2,041
Manpower	$1,802	$5,352	$5,208	$5,208
Irrigation Materials	$0	$0	$0	$0
Primo			$870	$870
Field Renovation				
Fertigation			$4,253	

Sports Field Management System Manual

This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to reflect your capabilities. It currently calls for a granular fertilizer and a liquid application of Primo Growth Regulator instead of the fertigation program we are recommending.

DATE: 12/29/10 **SQ.FT:** 56680 **Torrance Park**

APPLICATION SCHEDULE: City of Torrance

WEEK OF	30-5-10 GALS	0-45-0 LBS	0-0-50 LBS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Fracture Tine	Knife Aeration	Plug Aerate	Over Seed	Top Dress
01/01/11	0	0	0	0	1	1.0					
01/08/11					1	1.0					
01/15/11					1	1.0					
01/22/11					1	1.0					
01/29/11	94	0	74	0	1	1.0		X			
02/05/11					1	1.0					
02/12/11					1	1.0					
02/19/11					1	1.0					
02/26/11	0	0	0	0.26	2	1.0		X			
03/05/11					2	1.0					
03/12/11					2	1.0					
03/19/11					2	1.0					
03/26/11	94	0	74	0.26	2	1.0		X			
04/02/11					2	1.0					
04/09/11					2	1.0					
04/16/11					2	1.0					
04/23/11	0	0	0	0.26	2	1.0		X		X	
04/30/11					2	1.0					
05/07/11					2	1.0					
05/14/11					2	1.0					
05/21/11					2	1.0					
05/28/11	94	0	0	0.26	2	1.0		X			
06/04/11					2	1.0					
06/11/11					2	1.0					
06/18/11					2	1.0					
06/25/11	0	0	0	0.26	2	1.0		X			
07/02/11					2	1.0					
07/09/11					2	1.0					
07/16/11					2	1.0					
07/23/11					2	1.0					
07/30/11	94	0	0	0.26	2	1.0		X			
08/06/11					2	1.0					
08/13/11					2	1.0					
08/20/11					2	1.0					
08/27/11	0	0	0	0.26	2	1.0		X			
09/03/11					2	1.0					
09/10/11					2	1.0					
09/17/11					2	1.0					
09/24/11	94	0	0	0.26	2	1.0		X			
10/01/11					2	1.0					
10/08/11					2	1.0					
10/15/11					2	1.0					
10/22/11	0	0	0	0	2	1.0		X			
10/29/11					2	1.0					
11/05/11					2	1.0					
11/12/11					2	1.0					
11/19/11					2	1.0					
11/26/11	0	0	0	0	2	1.0		X			
12/03/11					1	1.0					
12/10/11					1	1.0					
12/17/11					1	1.0					
12/24/11					1	1.0		X			

Nitrogen	30-5-10	472	gls
	0-45-0	0	lbs
	0-0-50	147	lbs
Primo		2.11	gls

.5 Mowings per week= Mowing every 14 days
1 Mowing per week= Mowing every 7 days
1.5 Mowings per week = Mowing every 5 days
2 mowings per week= Mowing every 4 days
2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 613 activity weighted hours. If this is soccer with a rating of 2, this is an excess of 307 actual hours per year more than the turf can tolerate. When you step up your maintenance level .5 to level 2, this site can be sustainable.

City of Torrance Square Ft. 56680

Torrance Park

FIELD USAGE / AVAILABILITY ANALYSIS

Type of Grass:	Weeks/ YR 47	Total Hours	Average	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
K BLUE GRASS	Weeks/ mo			4	5	4	4	5	4	4	5	4	4	4	4
Current Actual Hours on the Field /Wk		710	15	5.0	5.0	5.00	5.13	5.00	5.00	2.00	28.50	35.00	35.00	24.06	13.20
Current Activity Weighted Hours Hrs/Wk		1434	30.51	7.5	7.5	7.45	7.58	7.45	7.45	3.70	56.60	69.70	69.70	69.70	26.40
Current Wear Level/ Needed Maint. Level-			2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4.00	4.50	4.50	4.50	1.50
Turfgrass Recovery Index-% of Healing				52%	58%	64%	81%	90%	99%	99%	97%	99%	99%	75%	52%
Field Availability	**(Numbers represent activity-weighted hours per week)**														
Current Maint. Level 0.50	Hours Allowed	821	16.08	10.40	11.60	12.80	16.20	18.00	19.80	19.80	19.40	19.80	19.80	15.00	10.40
	Hours Available			2.95	4.15	5.35	8.63	10.55	12.35	16.10					
	Excess hours of usage	613	13.04								37.20	49.90	49.90	54.70	16.00
Maint. Level 2.00	Hours Allowed	1437	28.15	18.20	20.30	22.40	28.35	31.50	34.65	34.65	33.95	34.65	34.65	26.25	18.20
	Hours Available	3		10.75	12.85	14.95	20.78	24.05	27.20	30.95					
	Excess hours of usage										22.65	35.05	35.05	43.45	8.20
Maint. Level 3.00	Hours Allowed	1847	36.19	23.40	26.10	28.80	36.45	40.50	44.55	44.55	43.65	44.55	44.55	33.75	23.40
	Hours Available	413		15.95	18.65	21.35	28.88	33.05	37.10	40.85					
	Excess hours of usage										12.95	25.15	25.15	35.95	3.00
Maint. Level 4.00	Hours Allowed	2258	44.23	28.60	31.90	35.20	44.55	49.50	54.45	54.45	53.35	54.45	54.45	41.25	28.60
	Hours Available	824		21.15	24.45	27.75	36.98	42.05	47.00	50.75					2.20
	Excess hours of usage										3.25	15.25	15.25	28.45	
Maint. Level 5.00	Hours Allowed	2874	56.29	36.40	40.60	44.80	56.70	63.00	69.30	69.30	67.90	69.30	69.30	52.50	36.40
	Hours Available	1440		28.95	33.15	37.35	49.13	55.55	61.85	65.60	11.30				10.00
	Excess hours of usage											0.40	0.40	17.20	

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	2.0
Mowings/ Yr	26	92
Aerations/Yr	0	0
Top Dress/Yr	0	0
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	0
Verticuttings/yr	0	0
Annual Costs	$4,353	$9,495
Ann. Increase		$5,142
Cost/month	$84	$183
Cost/week	$21	$46

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practices	**2.00**
Adult Soccer & Football Games	**2.13**
Adult Soccer & Football Practice	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tournaments	**2.50**
Current Wear Level	**2.00**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**2.0**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

.

We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
Walteria Park Field

Current Conditions of the field

The 2" root depth is too shallow to stand up to the wear it is currently receiving. This is reflected in the compacted areas and bare spots. Also the compaction leads to the poor grades and high and low spots.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS	WET/DRY SPOTS
Walteria Park	2.00	Poor	25%	30%	45%	Ok		X	

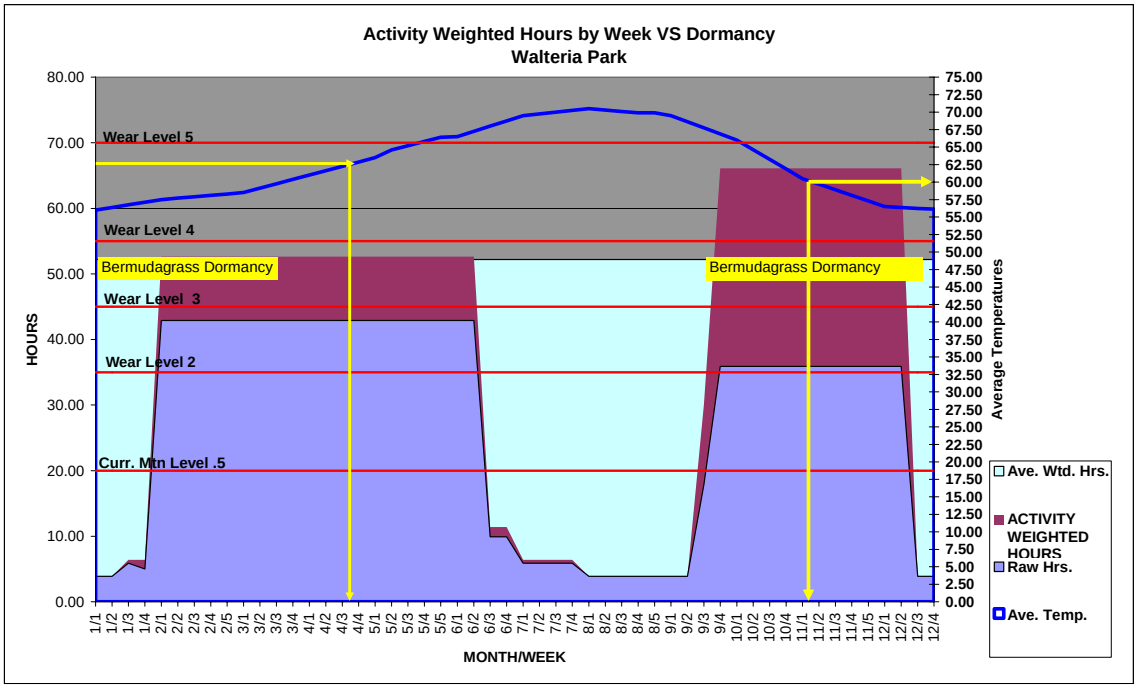
The Causes of the Current Conditions

1. Wear has led to many of the current problems on this field.
Your wear is probably the greatest contributor to compacted soils and the resulting damage to your turf. The Wear Index In Hours Per Week table below shows that this field has **52.2** activity-weighted hours of play per week. This is wear level **3.5** and the maintenance level is .5. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance. This difference equals unsustainable turf.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Walteria Park	54612	52	52.2	3.50	0.50

Note on the following page the Activity Weighted Hours by Week Chart for this field. The heaviest wear on these fields takes place September through Mid December (65 activity weighted hours per week). The yellow lines indicate the dormancy of the Bermuda grass from the end of November to the third week in April and unfortunately you have heavy wear during this dormancy your. This is why we have prescribed the Hybrid Blue grasses for this site.



2. The Current Maintenance Level of the Site

The Wear Index shows this site has a category **3.5** wear and your current maintenance level is .5. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The major increase is in the number of aerations, fertilizations and mowings. The mowings would be cut in half if you follow our recommendations for using a Primo type growth regulator that uses the energy from the additional fertilizations to mend and drive roots down.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Walteria Park	0.50	3.50	26	122	0	12	0	1	0	1	0	6

3. The Soil Analysis:

The soils in this root-zone are a Sandy Loam with 62% sand and 38% silt and clay. These silt and clay particles will still compact under heavy wear and moisture conditions.

SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.30	0.71	Hi	Sandy Loam	7.00	11.00	170	496	60	2986	495	188	24.00	50.00	5.00	4.70	1.78
RECOMMENDED		LOW	S.LOAM	3.5%+		50 PPM	212.00	12 PPM	1300 PPM	135 PPM	35 PPM	.5 PPM	15 PPM	2 PPM	.4 PPM	<1
LBS/ 1000 SQ FT. NEEDED					4.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
								<800								

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
21	0%	6%	71%	20%	4%	100.0
RECOMMENDED LEVE 12-14					<5	<150

SAND%	SILT%	CLAY%
62.00%	24.00%	14.00%

Below is a comparison of the leaf analysis and soil analyses for this site. In this case all of the soil parameters are above the minimums in soil but Magnesium is marginal in the leaf and Manganese is low in the leaf. We will wait until next year to see if the changes we are recommending will increase these in the leaf.

				Leaf Analysis Comparison								
		Phos.	Pottas.	Calci.	Magnes.	Sulfur	Zinc	Iron	Mang.	Copper	Boron	Sodium
Walteria	Total % N	% P	% K	% Ca	%Mg	% S	Zn ppm	Fe ppm	Mn ppm	Cu ppm	B ppm	% Na
Needed	2-2.8	0.3-0.6	2-4%	0.2-1.5	0.25-0.6	0.2-0.6	20-250	50-500	50-300	5-50 ppm	5-60 ppm	<0.5
12/1/2010	3.44	0.43	2.75	0.47	0.23	0.29	67.00	230.00	30.00	10.00	9.00	0.18
					Low				Low			
				Soil Analysis Comparison								
Walteria	ppm N	ppm P	ppm K	ppm Ca	ppm Mg	ppm S	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm Na
Needed	5.00	50.00	200.00	1400.00	400.00	15.00	3.00	15.00	2.00	1.50	0.75	30.00
12/1/2010	11	170	496	2986	495	60	24	50	5	4.7	1.78	188

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to your wear level of 3.5, you will add 146 additional annual man-hours or approximately $5,952 annually in maintenance costs on this field based on your current wages & benefits if you do this in house. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Walteria Park	54612	52	52.2	3.50	0.50	49	206	156	$2,011	$8,354	$6,344

2. Fertilizer Costs

The 2011 fertilization program below is for a granule / liquid program rather than the fertigation program we are recommending.

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Lbs	Lbs	Potassium	LFA	Sodium	Con. Organic	Primo	
Product	Nitrogen	Phosphorus	0-0-50	Organics	Blocker	Growth Med.		
Formulation	30-5-10	0-45-0	0-0-50					
Form	Lbs	Lbs.	Lbs	Gallons	Gallons	Lbs	Gallons	
Walteria Park	728	0	0	0	15	0	3	
Cost Each	0.46	0.65	0.50	16.50	16.00	0.70	316.85	
Total Cost	$335	$0	$0	$0	$240	$0	$885	$1,460

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $6,108 it cost you in 2009 to maintain this site. This is $4,872 per acre per year. Scenario #2 shows the $15,587 in costs which is $9,479 more in additional manpower and materials for stepping up your maintenance from level .5 to level 3.5 if you do this in house. This is $12,433 per acre per year. Scenario #3 shows the $17,826 1 time annual cost including fertigation new equipment that is needed. Scenario #4 shows the $11,096 in annual costs of maintaining your fields after the purchase of the new equipment. This is $8,850 per acre per year which is in the mid to high range for high wear fields in your climate. **This reflects a 20% savings in water if all of the recommendations in this report are implemented.**

SCENARIO COST ANALYSIS

Walteria Park	**Scenario #1** **2010** **Current** **Wear** **Mtn Level** **0.50** **No New** **Equipment**	**Scenario #2** **2011** **Current** **Wear** **Mtn Level** **3.5** **No New** **Equipment**	**Scenario #3** **2011** **Current** **Wear** **Mtn Level** **3.5** **Purchase** **New** **Equipment**	**Scenario #4** **2012** **Current** **Wear** **Mtn Level** **3.5**
	$4,872	$12,433	$14,218	$8,850
Square Feet	54,612	54,612	54,612	54,612
ANNUAL TOTALS:	$6,108	$15,587	$17,826	$11,096
Top dressing	$0	$959	$959	$479
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$717	$717	$358
Slit Seed- Contractor	$0	$0	$0	
Fertilizer	$0	$1,460	$1,190	$1,190
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Manpower	$2,011	$8,354	$5,790	$5,790
Water Costs	$4,098	$4,098	$4,098	$3,278
Irrigation Parts	$0	$0	$0	$0
Primo			$838	
Fertigation			$4,235	

Sports Field Management System Manual

This calendar on the next page is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to reflect your capabilities. It currently calls for a granule / liquid program rather than the fertigation program we are recommending. It also calls for spraying the Sodium Blocker and the Primo product monthly during the growing season.

DATE: 12/29/10 **SQ.FT:** 54612 **Walteria Park**

APPLICATION SCHEDULE: City of Torrance

WEEK OF	30-5-10 LBS	11-52-0 LBS	S Blocker GALS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter TINE	KNIFE Aerate	PLUG Aerate	OVER SEED	TOP DRESS
01/01/11	0	0	1.25	0	1	1.0		X			
01/08/11					1	1.0					
01/15/11					1	1.0					
01/22/11					1	1.0					
01/29/11	121	0	1.25	0.28	3	1.5		X			
02/05/11					3	1.5					
02/12/11					3	1.5					
02/19/11					3	1.5					
02/26/11	0	0	1.25	0.28	3	1.5		X			
03/05/11					3	1.5					
03/12/11					3	1.5					
03/19/11					3	1.5					
03/26/11	121	0	1.25	0.28	3	1.5		X			
04/02/11					3	1.5					
04/09/11					3	1.5					
04/16/11					3	1.5					
04/23/11	0	0	1.25	0.28	3	1.5		X			
04/30/11					3	1.5					
05/07/11					3	1.5					
05/14/11					3	1.5					
05/21/11					3	1.5					
05/28/11	121	0	1.25	0.28	3	1.5	X	X	X	X	X
06/04/11					3	1.5					
06/11/11					3	1.5					
06/18/11					3	1.5					
06/25/11	0	0	1.25	0.28	3	1.5		X			
07/02/11					3	1.5					
07/09/11					3	1.5					
07/16/11					3	1.5					
07/23/11					3	1.5					
07/30/11	121	0	1.25	0.00	1	1.0		X			
08/06/11					1	1.0					
08/13/11					1	1.0					
08/20/11					1	1.0					
08/27/11	0	0	1.25	0.00	1	1.0		X			
09/03/11					1	1.0					
09/10/11					1	1.0					
09/17/11					1	1.0					
09/24/11	121	0	1.25	0.28	1	1.0		X			
10/01/11					3	1.5					
10/08/11					3	1.5					
10/15/11					3	1.5					
10/22/11	0	0	1.25	0.28	3	1.5		X			
10/29/11					3	1.5					
11/05/11					3	1.5					
11/12/11					3	1.5					
11/19/11					3	1.5					
11/26/11	0	0	1.25	0.00	3	3.0		X			
12/03/11					1	1.0					
12/10/11					1	1.0					
12/17/11					1	1.0					
12/24/11					1	1.0					

Nitrogen	30-5-10	607	gls
	11-52-0	0	lbs
Primo		2.26	gls
Sodium Blocker		15.00	gls

.5 Mowings per week= Mowing every 14 days
1 Mowing per week= Mowing every 7 days
1.5 Mowings per week = Mowing every 5 days
2 mowings per week= Mowing every 4 days
2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that at your current maintenance level of .5 (the yellow bar across the chart) you currently have an excess hours of annual usage of 1120 activity weighted hours. If this is soccer with a rating of 2, this is an excess of 560 actual hours per year more than the turf can tolerate. When you step up your maintenance level .5 to level 4, you could add and additional 317 activity weighted hours or 158 hours per year more on this site.

City of Torrance Square Ft. 54612

Walteria Park

FIELD USAGE / AVAILABILITY ANALYSIS

Type of Grass:	Weeks/ YR	36	Total Hours	Average	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
K BLUE GRASS	Weeks/ mo				4	5	4	4	5	4	4	5	4	4	4	4
Current Actual Hours on the Field /Wk			1356	38	4.7	42.9	42.90	42.90	42.90	26.40	5.90	3.90	15.40	35.90	29.68	23.10
Current Activity Weighted Hours Hrs/Wk			1941	53.91	5.6	52.7	52.65	52.65	52.65	32.03	6.40	3.90	26.00	66.10	66.10	41.22
Current Wear Level/ Needed Maint. Level-				3.50	1.00	3.50	3.50	3.50	3.50	1.50	1.00	1.00	1.50	4.50	4.50	2.50
Turfgrass Recovery Index-% of Healing					52%	58%	64%	81%	90%	99%	99%	97%	99%	99%	75%	52%
Field Availability	**(Numbers represent activity-weighted hours per week)**															
Current Maint.	Hours Allowed		821	16.08	10.40	11.60	12.80	16.20	18.00	19.80	19.80	19.40	19.80	19.80	15.00	10.40
Level	Hours Available				4.83						13.40	15.50				
0.50	Excess hours of usage		1120			41.05			34.65	12.23					51.10	30.82
Maint. Level	Hours Allowed		1437	28.15	18.20	20.30	22.40	28.35	31.50	34.65	34.65	33.95	34.65	34.65	26.25	18.20
2.00	Hours Available				12.63					2.63	28.25	30.05	8.65			
	Excess hours of usage		504	14.00		32.35	30.25	24.30	21.15					31.45	39.85	23.02
Maint. Level	Hours Allowed		1847	36.19	23.40	26.10	28.80	36.45	40.50	44.55	44.55	43.65	44.55	44.55	33.75	23.40
3.00	Hours Available				17.83					12.53	38.15	39.75	18.55			
	Excess hours of usage		94	2.60		26.55	23.85	16.20	12.15					21.55	32.35	17.82
Maint. Level	Hours Allowed		2258	44.23	28.60	31.90	35.20	44.55	49.50	54.45	54.45	53.35	54.45	54.45	41.25	28.60
4.00	Hours Available		317		23.03					22.43	48.05	49.45	28.45			
	Excess hours of usage					20.75	17.45	8.10	3.15					11.65	24.85	12.62
Maint. Level	Hours Allowed		2874	56.29	36.40	40.60	44.80	56.70	63.00	69.30	69.30	67.90	69.30	69.30	52.50	36.40
5.00	Hours Available		933		30.83			4.05	10.35	37.28	62.90	64.00	43.30	3.20		
	Excess hours of usage					12.05	7.85								13.60	4.82

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	3.5
Mowings/ Yr	26	122
Aerations/Yr	0	0
Top Dress/Yr	0	1
Over Seed/Yr	0	1
Fertilization/Yr	0	18
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$6,108	$15,587
Ann. Increase		$9,479
Cost/month	$118	$301
Cost/week	$29	$75

Activity Weighting Scale	
Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practices	**2.00**
Adult Soccer & Football Ga	**2.13**
Adult Soccer & Football Pra	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tourname	**2.50**
Current Wear Level	**3.50**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**3.5**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.

Field Overview Assessment
Hull Field

Current Conditions of the site

The 2” root zone depth is too shallow to sustain turf at the projected wear level you will have at this site. This is a brand new field that was not graded properly when it was built. This is why it has some low spots and high spots. It was also observed that there were some weeds growing in the Hybrid Bermuda that need to be sprayed out. Fungus was observed which will require applications of an appropriate fungicide.

INITIAL SITE SURVEY

SITE	ROOT DEPTH	FIELD GRADE	% BARE SPOTS	% WEEDS	% Compacted Areas %	IRRIGATION SYSTEM	% WORN AREAS	HIGH/LOW SPOTS
Hull School	2.00	Poor		X		Good		X

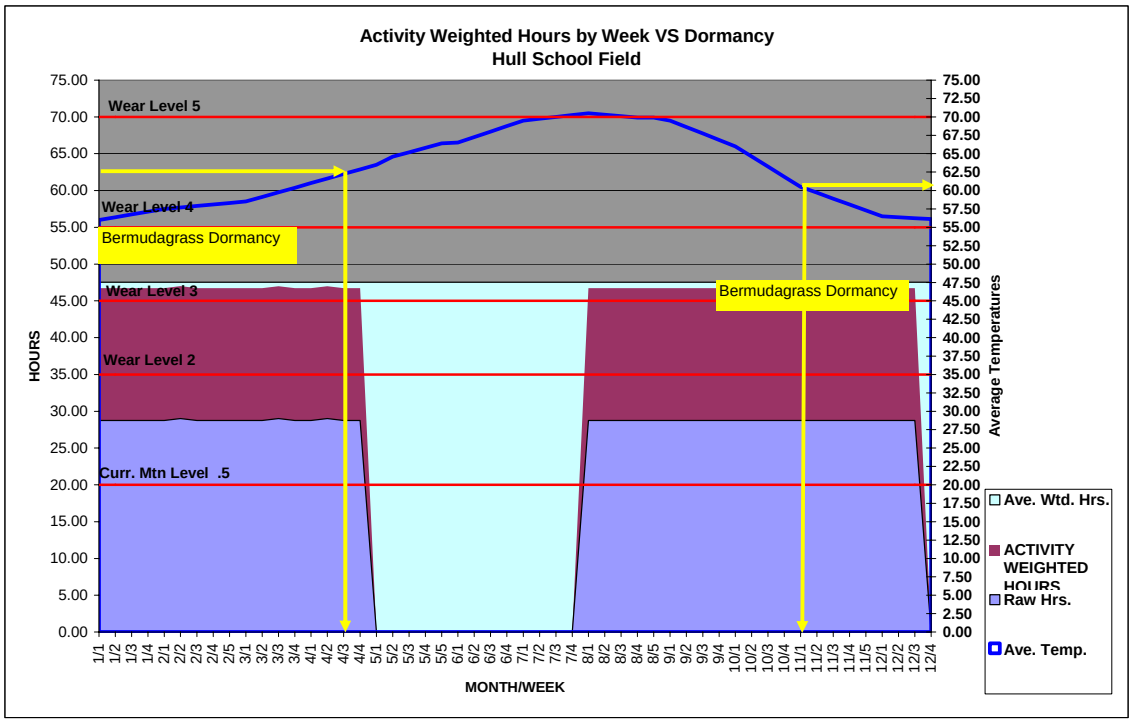
The Causes of the Current Conditions

1. **Poor Construction has** contributed to the few problems on this field.
Your wear will probably be the greatest contributor to compacted soils and the resulting damage to your turf in the future on this site. The Wear Index In Hours Per Week table below shows that this field has **47.5** activity-weighted hours of play per week. This is wear level **3** and the maintenance level is .5. The amount of play is scaled into levels 1-5, 5 being the highest and there is a direct correlation between wear and maintenance. This difference equals unsustainable turf over time.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL
Hull School	172000	52	47.5	3.00	0.50

Note on the following page the Activity Weighted Hours by Week Chart for this field. The heaviest wear on this field will take place from August through May (47.5 activity weighted hours per week). The yellow lines indicate the dormancy of the Bermuda grass and this is why we are recommending the over-seeding with a rye grass during the dormant season. This over seeding will not provide all of the protection the Bermuda grass will need to prevent injury. For future consideration might include transitioning the Hybrid Bermuda out by a systematic over-seeding with Hybrid Bluegrass because there would be no dormancy at your location and this grass mends year round.



2. The Current Maintenance Level of the Field

The Wear Index shows this field has a category **3.0** wear and your current maintenance level is .5. **N**ote that the Maintenance Frequency chart below shows the tasks necessary for your turf to be sustainable under your current conditions of wear, soils and growing conditions. The biggest increase is in mowings, aerations and fertilizations. If you follow our recommendations you will be able to offset these increases with savings in manpower, fertilizer and water.

MAINTENANCE FREQUENCY

	CATEGORY Level		MOWINGS PER YEAR		AERATIONS PER YEAR		TOP-DRESS PER YEAR		OVERSEED PER YEAR		FERTILIZE PER YEAR	
	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL	CURR LEVEL	NEW LEVEL
Hull School	0.50	3.00	50	121	0	12	0	0	0	1	0	6

3. The Soil Analysis:

The soils in this root-zone are Sandy Loam and have 76% sand and 24% silt and clay. These silt and clay particles will compact under heavy wear and moisture conditions and again, compaction is your worst enemy. This field will require nitrogen, and potassium this next season and these needs will be met by the fertilization program we recommend in the maintenance calendar.

FIELD: **Hull School** — SOIL ANALYSIS

pH	SALT MMMOS	LIME %		ORGAN. %	NIT. N PPM	PHOS. P PPM	POTAS. K PPM	SULF S PPM	CALC. Ca PPM	MAGN. Ma PPM	SOD. Na PPM	ZINC Zn PPM	IRON Fe PPM	MANG. Mn PPM	Cu PPM	Boron
7.90	0.25	No	Sandy Loam	2.50	1.00	130	217	20	1826	214	74	9.00	79.00	23.00	2.60	0.71
Recommended		LOW	S.LOAM	3.5%+		50 PPM	212.00	12 PPM	1300 PPM	135 PPM	35 PPM	.5 PPM	15 PPM	2 PPM	.4 PPM	<1
LBS/ 1000 SQ FT. NEEDED					4.00	0.00	0.50	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
								<800								

CATION EXCHANGE CAPACITY

%CEC	%H	%K	%Ca	%Mg	%Na	Chlor
12	0%	5%	77%	15%	3%	40.00

SAND%	SILT%	CLAY%
76.00%	15.00%	9.00%

Costs of Solving Your Problems

1. Manpower

The wear index chart below indicates that by increasing your maintenance level from .5 to 3.0 you will add 151 additional annual man-hours or approximately $6,137 annually in maintenance costs on this site based on your current wages & benefits if you do this in house. This figure doesn't include the additional materials such as fertilizer, seed, and topdressing.

WEAR INDEX IN HOURS PER WEEK

SITE	SQ. FT	# WEEKS	ACTIVITY WEIGHTED HOURS/ WK	MAINT. LEVEL NEEDED CATEGORY	CURRENT MAINT. LEVEL	CURRENT ANN. MTN. HOURS	NEEDED ANN. MTN. HOURS	ADDITONAL ANN. MTN. HOURS	CURRENT APPROX. MTN.COST	NEW APPROX. MTN.COST	$ INCREASE
Hull School	172000	52	47.5	3.00	0.50	72	223	151	$2,907	$9,045	$6,137

2. Fertilizer Costs

The 2011 is for a granule / liquid program rather than the fertigation program we are recommending

TURF NUTRIENTS REQUIRED FOR 2011 GRANULE / LIQUID PROGRAM

Nutrient	Nitrogen	Phosphorus	Potassium	LFA	Sodium	Primo	
Product				Organics	Blocker		
Formulation	30-5-10	0-45-0	0-0-50				
Form	Lbs	Lbs.	Lbs	Gallons	Gallons	Gallons	
Hull School	2293	0	0	0	0	8	
Cost Each	0.46	0.65	0.50	16.50	199.64	316.85	
Total Cost	$1,055	$0	$0	$0	$0	$2,541	$3,596

3. Annual Maintenance Costs-

Scenario #1 below shows your current maintenance level and the $12,289 it will cost you in 2011 to maintain this field. This is $3,112 per acre per year. Scenario #2 shows the $24,498 in costs which is $12,209 more in manpower and materials for raising your current maintenance from level .5 to level 3. This is $6,204 per acre per year. Scenario #3 shows your 1 time annual cost of $24,607 including new fertigation equipment that is needed. Scenario #4 shows the $15,447 in annual costs of maintaining your fields after the purchase of the new equipment. This is $3,912 per acre per year which is in the low range for mid wear fields in your climate.

SCENARIO COST ANALYSIS

Hull School

	Scenario #1	Scenario #2	Scenario #3	Scenario #4
	2010 Current Wear Mtn Level 0.50 No New Equipment	**2011 Current Wear Mtn Level 3.0 No New Equipment**	**2011 Current Wear Mtn Level 3.0 Purchase New Equipment**	**2012 Current Wear Mtn Level 3.0**
	$3,112	$6,204	$6,232	$3,912
Square Feet	172,000	172,000	172,000	172,000
ANNUAL TOTALS:	$12,289	$24,498	$24,607	$15,447
Top dressing	$0	$0	$0	$0
Spread top dressing-Contractor	$0	$0	$0	$0
Grass Seed	$0	$2,258	$2,258	$1,129
Slit Seed- Contractor	$0	$0	$0	
Fertilizer	$0	$3,815	$962	$962
Deeptine aeration- Contractor	$0	$0	$0	$0
Contractor Mobilization	$0	$0	$0	$0
Manpower	$2,907	$9,045	$5,852	$5,852
Water Costs	$9,381	$9,381	$9,381	$7,505
Irrigation Parts	$0	$0	$0	$0
Primo			$2,406	
Fertigation			$3,749	

Sports Field Management System Manual

This calendar below is the preliminary one for the recommended maintenance plan. Once you decide what recommendations you will be able to implement for the 2011 maintenance year, this will be changed to reflect your capabilities. It currently calls for a granule / liquid program instead of the fertigation program we are recommending. It also calls for spraying the Primo product monthly during the growing season.

DATE: 12/29/10 **SQ.FT:** 180000 **Hull School**

APPLICATION SCHEDULE: City of Torrance

WEEK OF	30-5-10 LBS.	11-52-0 LBS	0-0-50 LBS	Primo GALS	Mowings/ Week W/O Primo	Mowings/Week With Primo	Shatter TINE	KNIFE Aerate	PLUG Aerate	OVER SEED	TOP DRESS
01/01/11	0	0	0	0	3	2.0					
01/08/11					3	2.0		X			
01/15/11					3	2.0					
01/22/11					3	2.0					
01/29/11	400	0	0	0.84	3	1.5		X			
02/05/11					3	1.5					
02/12/11					3	1.5					
02/19/11					3	1.5					
02/26/11	0	0	229	0.84	3	1.5		X			
03/05/11					3	1.5					
03/12/11					3	1.5					
03/19/11					3	1.5					
03/26/11	400	0	0	0.84	3	1.5		X			
04/02/11					3	1.5					
04/09/11					3	1.5					
04/16/11					3	1.5					
04/23/11	0	0	229	0.84	3	1.5		X			
04/30/11					1	1.0					
05/07/11					1	1.0					
05/14/11					1	1.0					
05/21/11					1	1.0					
05/28/11	400	0	0	0.84	1	1.0	X	X	X	X	X
06/04/11					1	1.0					
06/11/11					1	1.0					
06/18/11					1	1.0					
06/25/11	0	0	0	0.84	1	1.0		X			
07/02/11					1	1.0					
07/09/11					1	1.0					
07/16/11					1	1.0					
07/23/11					1	1.0					
07/30/11	400	0	0	0.84	3	1.5		X			
08/06/11					3	1.5					
08/13/11					3	1.5					
08/20/11					3	1.5					
08/27/11	0	0	0	0.84	3	1.5		X			
09/03/11					3	1.5					
09/10/11					3	1.5					
09/17/11					3	1.5					
09/24/11	400	0	0	0.84	3	1.5		X			
10/01/11					3	1.5					
10/08/11					3	1.5					
10/15/11					3	1.5					
10/22/11	0	0	0	0.84	3	1.5		X			
10/29/11					3	1.5					
11/05/11					3	1.5					
11/12/11					3	1.5					
11/19/11					3	1.5					
11/26/11	400	0	0	0	3	1.0		X			
12/03/11					1	1.0					
12/10/11					1	1.0					
12/17/11					1	1.0					
12/24/11											

Nitrogen	30-5-10	2400	gls	.5 Mowings per week= Mowing every 14 days
	11-52-0	0	lbs	1 Mowing per week= Mowing every 7 days
	0-0-50	457	lbs	1.5 Mowings per week = Mowing every 5 days
Primo		8.39	gls	2 mowings per week= Mowing every 4 days
				2.5 Mowings per week= Mowing every 3 days

MANAGING SPORTS FIELD WEAR

The Field Usage/Availability Analysis chart below shows that at your current maintenance level of .5 (the yellow bar across the chart) you currently have 919 Activity weighted hours more play annually than this field can tolerate. With PE rated at 1.5 this means you are playing on this site 612 more hours annually than the turf can tolerate. By increasing your maintenance tasks to level 3 (the recommended levels in this assessment), you will have sustainable turf at this site.

FIELD USAGE / AVAILABILITY ANALYSIS

Hull School	Square Ft. 172000	**Total**													
Type of Grass:	**Weeks/ YR** 38	**Hours Average**		**Jan.**	**Feb.**	**March**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Hybrid Bermuda Grass	**Weeks/ mo**			4	5	4	4	5	4	4	5	4	4	4	4
Field Availability	**(Numbers represent activity-weighted hours per week)**														
Current Maint.	Hours Allowed	821	16.1	10.4	11.6	12.8	16.2	18.0	19.8	19.8	19.4	19.8	19.8	15.0	10.4
Level	Hours Available							18.0	19.8	19.8					
0.50	Excess hours of usage	919		36.4	35.2						27.4			31.8	27.0
Maint. Level	Hours Allowed	1437	28.1	18.2	20.3	22.4	28.4	31.5	34.7	34.7	34.0	34.7	34.7	26.3	18.2
2.00	Hours Available							31.5	34.7	34.7					
	Excess hours of usage	303	8.0	28.6	26.5	24.4	18.5				12.8	12.1	12.1	20.5	19.2
Maint. Level	Hours Allowed	1847	36.2	23.4	26.1	28.8	36.5	40.5	44.6	44.6	43.7	44.6	44.6	33.8	23.4
3.00	Hours Available	107						40.5	44.6	44.6					
	Excess hours of usage			23.4	20.7	18.0	10.4				3.1	2.2	2.2	13.0	14.0
Maint. Level	Hours Allowed	2258	44.2	28.6	31.9	35.2	44.6	49.5	54.5	54.5	53.4	54.5	54.5	41.3	28.6
4.00	Hours Available	518						49.5	54.5	54.5	6.6	7.7	7.7		
	Excess hours of usage			18.2	14.9	11.6	2.3							5.5	8.8
Maint. Level	Hours Allowed	2874	56.3	36.4	40.6	44.8	56.7	63.0	69.3	69.3	67.9	69.3	69.3	52.5	36.4
5.00	Hours Available	1134					9.9	63.0	69.3	69.3	21.2	22.6	22.6	5.8	
	Excess hours of usage			10.4	6.2	2.0									1.0

Maintenance Frequencies-Annual Requirement

	Current	Needed
Maint. Level	0.50	3.0
Mowings/ Yr	50	121
Aerations/Yr	0	12
Top Dress/Yr	0	0
Over Seed/Yr	0	1
Fertilization/Yr	0	6
Sweeping	0	0
Deep Tine/Yr	0	1
Verticuttings/yr	0	0
Annual Costs	$12,289	$24,498
Ann. Increase		$12,210
Cost/month	$237	$472
Cost/week	$59	$118

Activity Weighting Scale

Walking on field/Softball	**1.00**
Baseball	**1.25**
PE	**1.50**
Parked Cars	**1.50**
Marching Band	**1.75**
Soccer Games	**1.85**
Football Games	**1.85**
Soccer & Football Practices	**2.00**
Adult Soccer & Football Ga	**2.13**
Adult Soccer & Football Pr	**2.25**
Lacrosse & Field Hockey	**2.25**
Rugby	**2.50**
Sports Clinics & Tourname	**2.50**
Current Wear Level	**3.00**
Current Maintenance Level	**0.50**
Needed Maint. Level-Weather Adjusted	**3.0**

Determining Field Availability

Use the following steps to evaluate requests for additional field time:

1. Determine the actual hours of additional use requested.
2. Multiply the total hours of proposed use by the appropriate activity weight.
3. Locate the column for the month when the proposed additional use would occur.
4. Determine if there are available hours at the current maintenance level. If there are, you can schedule the activity.
5. If not, see if sufficient hours can be made available by increasing the maintenance level.
6. If sufficient hours can be made available, and you can handle and afford the additional maintenance, you can schedule the activity.

This concludes our Sports Field Assessment for these 7 sites. We are here to help with the implementation of these recommendations and any phone conversations or email responses are included in our assessment fee.