Koi News

Vol. 9, No 5 | News From Around The Pond | May, 2003

A

Our Club logo pin was designed by Norman Call from a sketch by Ray Laval. Of all the pins I've seen I hadn't seen one with lettering on white, hence the need for two samples. The actual color of the blue is more like 'A' but it is a clear blue rather than a solid which gives it more depth [both are the same dark blue]. 'A' was shot by Norman, 'B' was by Tom Remigio.

It would be best for you to see the samples in person at the next meeting but your vote is appreciated. To vote you can go to http://sfbakc.org/koienews/pins.html, send an eMail to pins@sfbakc.org, or, if you don't have an eMail address, phone 925.372.0687

B

Koi News, Vol. 9, No. 5, May, 2003 ~ The newsletter of the San Francisco Bay Area Koi Club, 804 Standish Rd., Pacifica, CA 94044-4155•bobbiecervantes@hotmail.com•650.738.1935•http://sfbakc.org

KOI NEWS

SAN FRANCISCO BAY AREA KOI CLUB

Volume 9, Issue 5

Bite the Wax Tadpole*
~ Phred Jackson

Bobbie Cervantes, the new *Koi News* Editor, said, "…the main reason is that it was time for Gabriel and I to do something for the Club, since they have done so much for us." This is the kind of attitude we love to hear.

In your past "Volunteer" may have been considered a dirty word. In the context of the Koi Club it is just the opposite. Much fun, great joy, contact any committee chair and they will be glad to make you happy.

• **Koi Couple of the Year ~ Janet & Ron Freer** are recognised for the years of loyal service to the Club. Congratulations!

• **Tategoi ~ [All virtual]Sandra Rosenzweig** of Berkeley comments: I would very much appreciate a lead to someone who (for money) could make sure the pond is working perfectly, is clean, etc so I can get a clean (as it were) start 415-252-2475; **Ed Thomas** of Pleasanton, goal: Information, guidance, support and ability to help others; **Andrew Clauer**, San Francisco, wanted to attend a meeting to see if it was right for him [of course he joined]; **Pearl & Jeff Ulrich, San Leandro**, with a newly filled pond, goal: I'd like to know what to look for in koi when I get around to acquiring some for my pond. Which segues right into our next item:

• **Koi Selection ~** A special presentation by Larry Gill; 31 May, 11 am [sharp], at Genki Nishikigoi. Larry will speak on varieties other than gosanke and how AKCA judges them. It will be a FREE, non-meeting, Club event *FOR MEMBERS ONLY*. It's a pot luck. Please contact me if you're interested so Kevin will know how much space will be needed: phredrum@mindspring.com, 925.372.0687.

• **Web Site Judging ~** I just had the honor of judging 22 AKCA member club's web sites. The results will be announced at the AKCA Seminar this June in Atlanta, GA. There were five categories: Technical, Aesthetics, Navigation, Content and Cross Platform. I judged the first two and there are many fine web sites. You can see the list at akca.org. You don't realize how lucky we are or how easy we have it. Most of the clubs membership applications have to be printed out, filled out and mailed, rather than filling out an online form and hitting 'submit.' We are the *only* club of the 22 to accept payments online via PayPal. More and more clubs are offering PDF versions of their newsletter.

• **Pins ~** Norman Call designed the pin based on an idea from Ray Laval. The pins will be available for $5.00, 6 for $25.00, or 12 for $50.00. I know those of you who are planning to attend the AKCA seminar in Atlanta in June are going to want to take a handful to trade with your new friends.

Join us to learn more about pump selection, a very confusing subject especially for novice pond builders, on the 24th in lovely Pescadero.

** Chinese translation for Coca-Cola*

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Library - Kathleen Krudwig
Librarian 510-351-3380

New! Seminar CDs

Kokugyo
by Mamoru Kodama

Koi Kichi
by Peter Waddington

Still Waters
by Nigel Craddock

Biological Filtration
by Dick Ashbaugh

Pond Design and Filtration
by Ben Plonski

Water Synthetic Start-Up Procedure for New Ponds & Filters
by Norm Meck

Design with Nature in Mind, Fabrication of Artificial Stone
by Ron Benville

Defects Versus Deficiencies in Judging Koi
by Galen Hanson

Koi Transportation
by H. Gene Ewy, MD

Israeli Koi Vs Japanese Koi
by Bill Ridgeway

Koi For Profit, A Dealer's Perspective
by Andy Moo

Koi Health: A fish Veterinarian Perspective
by Jill Spangenber DMVM, Ph.D.

Koi Health: A fish Veterinarian Perspective
by Myron J. Kebus MS, DVM

Nishikigol Ulcer Diseases: Cause and Prevention
by Laura E. Swaim

Water Plants
by Cathy Green

Koi Pond Maintenance in Relation to Koi Health
by Ben Plonski

Garden Ponds-Marvelous Models or Maintenance Nightmares
by Gary G. Wittstock

Koi Classification
AKCA with Bob Spindola

Koi Health & Disease
by Erik Johnson, DVM

The Cult of the Koi
by Michugo Tamadachi

Living Jewels
by Ronnie Wat and Seraas de Kock

Koi
by Grant Fujita

Practical Koi Keeping, Vol. I, II & III

Believe
Achieve
Succeed
Read Books!

Board Meeting Minutes
~ David Muth

Board members present: Phred Jackson, Terri Noel, Sheila Jackson, Tom Remigio and Leon Nogue.

Phred received notification that chloramine and chlorine will be added to water the water this fall in San Francisco, San Mateo and Santa Clara counties.

New Business:
Phred suggested the club create a dealer ethics commitee to deal with local koi dealers when members have problems. It was decided there may be legal ramifications against the club if we proceed with this idea, board agreed not to go foward with suggestion at this time.

Phred wants a home page on a "I" disc which would cost the club $100.00 per year. After much discussion Tom suggested we present it to the membership for a vote.

Board meeting commenced at 10:45 am and ended 11:55 am.

Article ~ Why can't I use just any pump for my pond?

If you buy a pump that is way too small it may only move a trickle of water, or possibly none at all. One that is a bit larger can still be too small to give good aeration, filtration and surface skimming. Overloading a pump that is too small can result in a shorter pump life, and more repairs. Often people who buy too small a pump will buy 1 or more of the same pump, so they wind up running several pumps with higher operating costs than 1 properly sized pump.

On the other hand, choosing a pump that is too large will not only waste a lot of money to run it, but can actually result in damage to the plumbing and equipment.

In order to pick out the correct pump there are 5 steps you need to go through:

1. **Determine the volume of your pond;**
2. **Determine the flow you want based on the pond's volume;**
3. **Determine the correct pipe size to move the flow you want;**
4. **Determine the total dynamic head (TDH) or pump head based on your pipe size, flow rate, and equipment;**
5. **Determine the proper pump that will give you the desired flow rate at your TDH pump head.**

I. Determining the volume of your pond

The first thing you need to do is determine the volume of you pond. If you have not done that yet, for a rectangular pond, it is the length (ft) x width (ft) x depth (ft) x 7.48 gallons / cubic foot = U.S. Gallons.

II. Determining the flow you want

If you have a pond that is under a few thousand gallons you may want to turn it over 2 to 3 times per hours. If it is a larger pond you may want to turn it over only once every 2 hours.

Peter Waddington, in his book "Koi Kichi", says the real volume of water a fish lives in is determined by multiplying the flow per hour times 24 hours per day. So people with smaller ponds will want to turn them over more often than those with larger ponds.

So let's say you have a 5,000-gallon pond, and you want to turn it over every 1-½ hours. We simply divide the size of your pond by the number of hours you want for a complete turnover to get your flow rate. So for our example the flow needs to be 5,000 / 1.5 = 3,333 gallons per hour (GPH) or 3,333 / 60 = 55.5 gallons per minute (GPM).

The flow rate is very important in determining the pipe and pump size for your pond.

III. Determining the correct pipe size for your pond

The Plastic Pipe and Fittings Association (PPFA) says PVC pipe should be designed for a maximum flow-rate velocity of 5 to 8 feet per second (fps) through the pipe. They say 8 fps is ok for pipe sizes less than 1" in diameter, but it should be less than 5 fps for pipe sizes of 1 ¼ " or larger. Higher velocities can actually cause pipe failure and rupture, as well as astronomically large resistance to water flow, which necessitates higher horsepower requirements, and higher operating costs.

How do you determine the velocity of the flow rate in feet per second? The equation is:

$$\text{Velocity in fps} = .4085 \times \text{GPM} / d^2$$

Where GPM = gallons per minute, and d = inside diameter of the pipe in inches.

The following table shows the results of these fps calculations for various pipe diameters (d) and flow rates in GPH and GPM:

Table One

	GPH	**600**	**1,800**	**3,000**	**3,600**	**4,800**	**6,000**	**9,000**	**12,000**
	GPM	**10**	**30**	**50**	**60**	**80**	**100**	**150**	**200**
d nom."	**d act."**		**Velocity**	**through**	**pipe in**	**feet per**	**second**		
½ "	**0.608**	*11.05*	*33.15*	*55.25*	***66.30***	*88.40*	*110.51*	*165.76*	*221.01*
¾ "	**0.810**	*6.23*	*18.68*	*31.13*	***37.36***	*49.81*	*62.26*	*93.39*	*124.52*
1.00	**1.033**	*3.83*	*11.48*	*19.14*	***22.97***	*30.63*	*38.28*	*57.42*	*76.56*
1.25	**1.364**	*2.20*	*6.59*	*10.98*	***13.17***	*17.57*	*21.96*	*32.93*	*43.91*
1.50	**1.592**	*1.61*	*4.84*	*8.06*	***9.67***	*12.89*	*16.12*	*24.18*	*32.24*
2.00	**2.049**	*0.97*	*2.92*	*4.86*	***5.84***	*7.78*	*9.73*	*14.59*	*19.46*
2.50	**2.445**	***0.68***	***2.05***	***3.42***	***4.10***	***5.47***	***6.83***	***10.25***	***13.67***
3.00	**3.042**	*0.44*	*1.32*	*2.21*	***2.65***	*3.53*	*4.41*	*6.62*	*8.83*
4.00	**3.998**	*0.26*	*0.77*	*1.28*	***1.53***	*2.04*	*2.56*	*3.83*	*5.11*
5.00	**5.017**	*0.16*	*0.49*	*0.81*	***0.97***	*1.30*	*1.62*	*2.43*	*3.25*
6.00	**6.031**	*0.11*	*0.34*	*0.56*	***0.67***	*0.90*	*1.12*	*1.68*	*2.25*

Continued on Pg 4

So we need to pick a velocity that is less than 5 fps from the above table. So looking at the above table for our example, we want to look down the 3,600 GPH column (since we want a flow of 3,333) until we find an fps that is less than 5. When we do that we see 4.10 fps corresponds to a 2-½ " pipe.

One 2" pipe would be pushing the envelope, but we could use 2-2" pipes; like one 2" pipe from the bottom drain, and another 2" pipe from the skimmer. Both pipes could terminate in the ends of a Tee fitting, with valves for each, with the center branch feeding the pump. By the way, 2-2" pipes have about the same area as 1-3" pipe.

IV. Determining the Total Dynamic Head (TDH), or the sum of all the sources of pump head Ph, for your design

Head is best defined as "resistance to flow". The term "head" is further modified by whether the resistance is encountered on the suction side of the pump (suction head (H_S) from the pond to the pump) or the discharge side (discharge head (H_D) from the pump to the pond); whether it is caused by the standing height of the water (static head h_{sh} = height of the waterfall or fountain above the water's surface) or by the movement of water through the system (dynamic head = h_d); whether the resistance is caused by simple friction due to fittings and pipe sizing (friction head = h_f) or by the equipment resistance (h_e).

$$TDH = H_S + H_D = (h_{sh} + h_d + h_f + h_e)_S + (h_{sh} + h_d + h_f + h_e)_D$$

In order to determine the total dynamic head (TDH) we need to consider all of these sources:

1. When water flows through pipe there is a pipe friction or resistance at the inside surface of the pipe that needs to be overcome. That friction is a function of the diameter and length of the pipe.
2. When water flows through fittings like elbows, Tee's, valves, check valves, etc. there is turbulence that also causes resistance to water flow. This resistance is a function of the total number of each type of fitting, and is expressed in feet, as an equivalent length of pipe, **not as pump head**.
3. When water flows through a leaf-basket / strainer, skimmer, drain, etc., there is more resistance to flow, depending on the open area of that component, as well as how plugged up the holes are with algae, leaves, etc.
4. When water flows through a filter, the resistance to the flow depends on the filter media, size of the filter, the internal plumbing, the flow rate, how dirty it is, etc.
5. When water flows through an Ultra Violet sterilizer the center UV tube increases the resistance of that section of pipe to water flow.
6. A heater also will increase resistance to water flow as it squeezes the flow down into a smaller 1" tube, and makes a "U" turn in the heat exchanger, and adds more pipe length and fittings to the design.
7. Another source of TDH or Ph is the static lift in the pond design. An example of this is the height of a fountain, statue, or waterfall above the surface of the pond water.

This TDH or Ph is the most difficult calculation for everyone, because it is very complicated. Here is a table of the resistance in feet of pump head for every 10-foot length of pipe as a function of water flow:

Table Two

	GPH	**600**	**1,800**	**3,000**	**3,600**	**4,800**	**6,000**	**9,000**	**12,000**
	GPM	**10**	**30**	**50**	**60**	**80**	**100**	**150**	**200**
d nom"	**d act"**		**Pump**	**head in**	**feet per**	**10 ft of**	**pipe**		
½ "	**0.608**	*7.80*	*59.66*	*153.65*	*215.37*	*366.92*	*554.69*	*1175.35*	*2002.42*
¾ "	**0.810**	*1.93*	*14.77*	*38.05*	*53.34*	*90.87*	*137.37*	*291.08*	*495.91*
1.00	**1.033**	*0.59*	*4.53*	*11.66*	*16.34*	*27.83*	*42.08*	*89.15*	*151.89*
1.25	**1.364**	*0.15*	*1.17*	*3.01*	*4.22*	*7.20*	*10.88*	*23.06*	*39.28*
1.50	**1.592**	*0.07*	*0.55*	*1.42*	*1.99*	*3.39*	*5.13*	*10.87*	*18.52*
2.00	**2.049**	*0.02*	*0.16*	*0.42*	*0.58*	*0.99*	*1.50*	*3.18*	*5.42*
2.50	**2.445**	*0.01*	*0.07*	*0.18*	*0.25*	*0.42*	*0.64*	*1.35*	*2.30*
3.00	**3.042**	*0.00*	*0.02*	*0.06*	*0.09*	*0.15*	*0.22*	*0.47*	*0.79*
4.00	**3.998**	*0.00*	*0.01*	*0.02*	*0.02*	*0.04*	*0.06*	*0.12*	*0.21*
5.00	**5.017**	*0.00*	*0.00*	*0.01*	*0.01*	*0.01*	*0.02*	*0.04*	*0.07*
6.00	**6.031**	*0.00*	*0.00*	*0.00*	*0.00*	*0.01*	*0.01*	*0.02*	*0.03*

Where do these values come from? The PPFA says to use the Hazen-Williams Equation.
The equation is:

$$Ph = 104.4 / C^{1.852} \times (GPM)^{1.852} / d^{4.8655}$$

where Ph is the pump head in feet per 10 feet of pipe, GPM is gallons per minute, d is the inside diameter of the pipe in inches, C is a pipe smoothness coefficient that is 150 for new PVC; 140 for smooth walled copper, brass, etc.; 100 for ordinary iron pipe; and 80 for old iron pipe.

Lasco's PVC fittings website also uses this equation to show the friction losses. However, they express the result as Pounds per square inch (PSI) per 100 feet of pipe length.

Continued on Pg 7

Koi Health Advisor / AKCA News ~ Sheila Jackson

The more you know about Koi, the more there is to know. This series of seminars is being developed to introduce novices as well as advanced hobbyists to the intricacies of Koi keeping, pond building, and filtration concepts and methods. We're planning a varied series of speakers, panel discussion, demonstrations and workshops. Everything will be centrally located in the hotel conference center.

Dr. Galen Hansen,
AKCA/ZNA Judge Certification Committee, California:
Koi Judging from Slides.
Galen will start off this year's seminar with a 2-hour block using slides to describe how Koi are judged.

AKCA Judging Committee:
Koi Judging Panel Discussion.
This 2-hour follow-up to the slide judging is a question-and-answer session with the AKCA Judging Committee Panel.

AKCA Judging Committee:
Live Koi Judging.
View the live video and hear the judges' comments while judging approximately 20 Koi from Nishikigoi of Niigata as if it was an abbreviated Koi show.

Chris Neaves, South African Koi Keepers Society:
Koi Keeping in South Africa.
As our Keynote Speaker Chris will begin by describing Koi-keeping techniques in South Africa.

Chris Neaves, South African Koi Keepers Society:
Stress in Koi.
Chris is a well-known expert when it comes to Koi health and will summarize the effects of stress on the health of Koi.

Burt Ballou,
AKCA Judge, California:
New Technology and Products for Koi Keepers.
Burt's expertise in pond construction shines through as he discusses all the new things for the Koi hobbyist.

Bryan Bateman,
AKCA Candidate Judge:
Filtration
Bryan has written several articles for Koi Magazines such as Mid-Atlantic Koi and is considered an expert in filtration.

Maureen Behrens,
Pond Bloomers, Georgia:
Plants.
Maureen is a long-time member supporting the Atlanta Koi Club is a well-known expert regarding water plants.

Bob Brudd,
AKCA Candidate Judge, Illinois:
Koi Buying Trips to Japan.
Bob has put together an excellent presentation giving helpful advice to anyone planning a trip to Japan..

Joel Burkard,
Pan Intercorp, Washington:
Tategoi.
Joel will give you some detailed tips on how to select a Koi with great potential.

Vicki Burnley, Univ. of Georgia:
Antibiotic Dip.
Vicki will tell you about a new antibiotic dip that treats and heals bacterial infections and ulcers without injections.

Richard Chesler, Florida:
How to Recognize Show Koi.
Richard will help the novice person interested in learning how to identify a show quality Koi.

Steve Childers
AKCA Judge, Texas
Pond Design Dynamics.

Steve will be joined by a panel of guests presenting some ideas on diffuser drains, TPR'S, Skimmers, Midlevel drains, etc, and their placement for optimal effects.

Trevor Cole
Pond Wise, Alabama:
Filtration... The Old Fashion Way.
Trevor Cole brings some traditional British views about filtration as with multi-chambered filter systems.

Spike Cover,
AKCA, California
Koi Health Advisor Program.
Spike will provide an status update on the AKCA KHA Program. Beginning in July, Georgia will be one the states in this program.

Doug Dahl
AKCA/ZNA Judge, California:
Koi Classification & Judging Criteria
Doug has presented this briefing alongside the show tanks at many Koi shows throughout the states.

Doug Dahl
AKCA/ZNA Judge, California:
Beginning Koi Tutorial.
Doug will teach the basics of every aspect of Koi care, water, ponds, etc. in this new 4-hour presentation.

Peggy Ferguson, The Pond Doc's Water Garden Center, Georgia:
Koi research Using the Internet.
Peggy will show everyone how to find out just about anything and everything about Koi on the internet.

Carl Foress
Koi by Keirin, Pennsylvania:
Pond Construction.
Carl will show you some tricks and procedures needed to install a good quality Koi pond.

Bonnie E. Hale
Sunburst Ponds, N. Carolina:
Plants.
Bonnie has over 30 years of landscaping experience and is well known for her selection of pond plants and expertise in caring for Koi and their health.

Bob Heideman
Aquatic Eco Systems, Florida:
Aeration.
Bob is the founder of AES and an expert in the area of aeration. Learn how to determine how much air is needed and why.

Tom Holder
Koi Care Kennel, California
Understanding Pathogenic Bacteria.
Tom developed Lymnozyme as well as other water treatments. Before you know what to use you need to understand the relationship of pathogens and Koi.

Dr. Erik Johnson, DVM, Georgia:
Quarantine.
A good quarantine procedure is getting more and more necessary, and Erik will tell you what makes up a good quarantine system and protocol.

Continued on Pg 6

Ray Jordan, San Antonio, Texas:
Showing Koi at the All Japan Koi Show.
Ray will tell you about attending the All Japan Show and what's involved in showing Koi in this prestigious show.

Bill Mason
Georgia Ponds, Georgia:
Plumb IT This Way for Pumps, UV"s and Skimmers.
Bill will share quite a few plumbing tricks that he's learned through his years of experience fixing ponds.

Joe Pawlak
Blackwater Creek Fish Farm, FL
Breet Rowley
Breet's Fish Farm, TX
Fish Farming.
Joe and Brett team up to present a very entertaining and informative view of fish farming.

Dr. Sandy Yosha, DVM
Univ. of Florida:
KHV, Viruses, Quarantine and Antibiotic Use in Koi.
Sandy is well known among all the KHA's and will share her knowledge focusing on Koi Herpes Virus and what can be done.

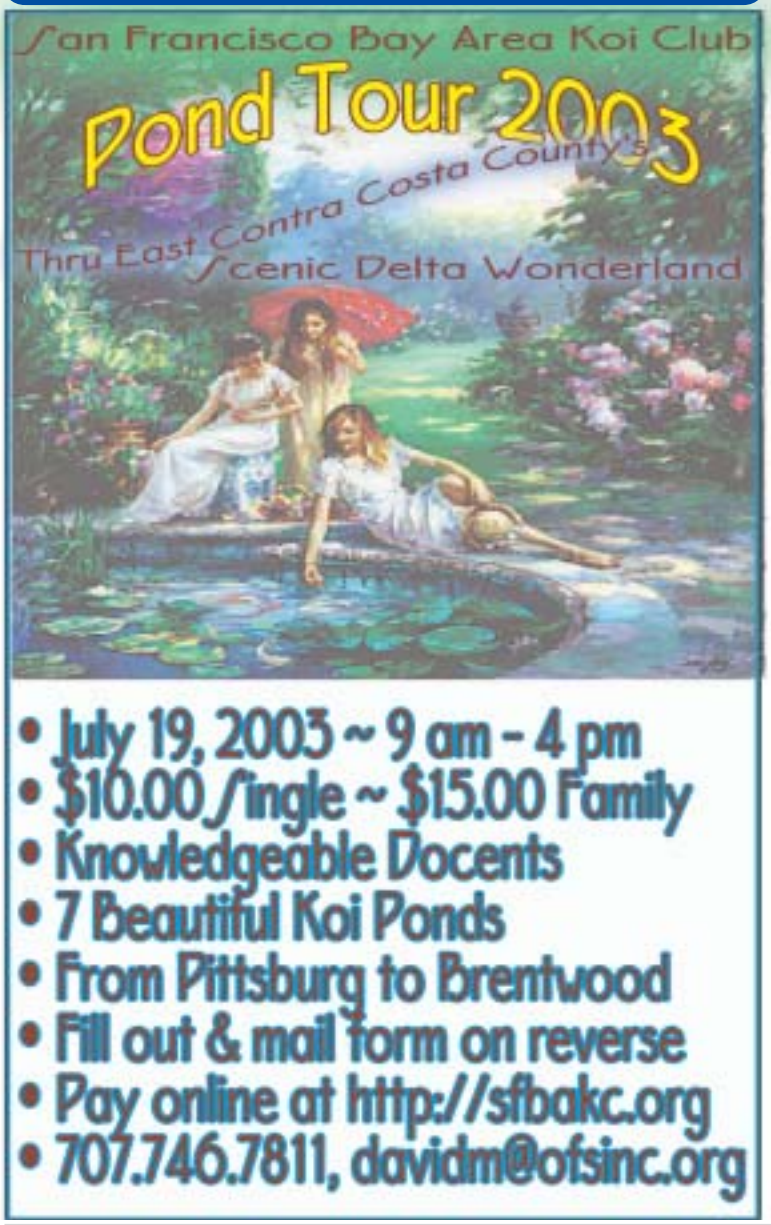
Trez Report ~ Tom Remigio

San Francisco Bay Area Koi Club
Cash Flow Report
April, 2003

Beginning Balance as of 03/31/2003		**$5,600.92**
Cash In:		
Membership Dues	84.00	
KoiUsa	20.00	
Water Garden	0.00	
Dealer's Ad	0.00	
Raffles	90.00	**194.00**
Cash Out:		
Shurgard Storage:		
Storage Rental	186.00	
Phred Jackson:		
Koi News Postage	54.00	
Printing Supplies	0.00	
Website Charge: VeoWeb	0.00	
Tom Remigio:		
QuickBooks Pro 2003	183.05	
Pet Expo Entry Fee	100.00	
Subscription Payments:		
KoiUsa	0.00	
PayPal Service Charge	0.88	
Bank Charges	0.00	**523.93**
Ending Balance as of 04/30/2003		**$5,270.99**

Look at our

Pond Tour Sign!!!



So according to the above table, if we have 30 feet of pipe, and a flow of 3,333 GPH, the pump head due to the pipe alone, without any fittings, would be 4.22 * 3 = **12.66 feet of pump head for 1 ¼ " pipe**; 1.99 * 3 = **6 feet for 1 ½ " pipe**; 0.58 * 3 = **1.7 feet for 2" pipe**, etc.

The next consideration is the number and type of fittings we plan to use. Following is a table of the resistance per fitting, expressed in length of equivalent pipe in feet, **not in feet of pump head**. This is a very important distinction and is a source of much confusion.

Table Three

Pipe d "	90º elbow	45º elbow	Tee-run	Tee-branch	Check valve	Gate valve
0.50	*1.5*	*0.8*	*1*	*4*	*5.2*	*0.4*
0.75	*2*	*1*	*1.4*	*5*	*6.5*	*0.55*
1.00	*2.3*	*1.4*	*1.7*	*6*	*8.7*	*0.7*
1.25	*3*	*1.8*	*2.3*	*7*	*10*	*0.9*
1.50	*4*	*2*	*2.7*	*8*	*13.4*	*1.1*
2.00	*6*	*2.5*	*4.3*	*12*	*17.2*	*1.4*
2.50	*7*	*3*	*5.1*	*15*	*20.6*	*1.6*
3.00	*8*	*4*	*6.3*	*16*	*25.5*	*2*
4.00	*10*	*5*	*8.3*	*22*	*33.6*	*2.7*

Assuming we are using a total length of 30 feet of 1 ½ " pipe, with six 90º elbows, two 45º elbows, four Tee's, 1 check valve, and 10 gate valves. We use Table Three to construct the following Table Four:

Table Four

Assuming 30' length of 1 1/2" pipe	# of fittings	ft / fitting	Equivalent pipe length
Length of pipe			*30*
90º elbows	*6*	*4*	*24*
45º elbows	*2*	*2*	*4*
Tee's - flowing through the run	*4*	*2.7*	*10.8*
Tee's - flowing through the branch	*4*	*8*	*32*
Check valve 100% open	*1*	*3.4*	*13.4*
Gate valve 100% open	*10*	*1.1*	*11*
Total equivalent pipe length			*125.2*

Using these values we get a total equivalent pipe length of 125.2 feet. Now we go to Table Two and find the pump head for a flow rate of 3,333 GPH, for a pipe diameter of 1 ½ ", which is 1.99 feet of pump head for every 10 feet of equivalent pipe length. Using these numbers to calculate the total pump head:

125.2 * 1.99 / 10 = 24.9 feet of pump head,
which is due to the friction losses through the 1 ½ " pipe and fittings.

When we perform this same calculation for all the pipe diameters at a flow-rate of 3,333 GPH, we get the following results:

Table Five

Pipe size	Ph
½ "	*2,696.4*
¾ "	*667.8*
1	*204.6*
1 ¼ "	*52.8*
1 ½ "	*24.9*
2	*7.3*
2 ½"	*3.1*
3	*1.1*

As you can see the pipe diameter has a huge effect on the pump head requirement. If we choose the correct pipe diameter, based on the 5 feet per second velocity restriction, as is shown in Table One, we would use a 2 ½ " pipe for a flow of 3,333 GPH. This would give us a pump head of 3.1 as seen in Table Five, and the guideline of "1 foot of pump head for every 10 feet of pipe" holds true for our 30 feet of pipe.

However, if we choose any other size of pipe, then this guideline does not hold true, and can be way off the mark. **So choosing the correct pipe size for our pond is absolutely critical.** As seen in Table Five, if we used the 1 ½ " pipe the pump head would be over 8 feet of pump head for every 10 feet of pipe.

Unfortunately this is an easy mistake for a beginner to make, and becomes very difficult to correct after the pond is constructed. There are too many ponds with the wrong size pipe buried deep under the liner, or concrete, or the waterfall with its many tons of rock and boulders.

The next step is to add the pipe and fittings pump head to the other equipment pump head losses (not equivalent pipe lengths) to get the Total Dynamic Head (TDH):

Continued on Pg 8

Table Six

	Pump head	PSI
Pipe & fittings	*24.9*	*10.8*
Bottom drain	*2.0*	*0.9*
Skimmers	*2.0*	*0.9*
Leaf-baskets	*2.0*	*0.9*
80 watt UV	*1.9*	*0.8*
Filter	*14.3*	*6.2*
Heater	*5.0*	*2.2*
Static lift of 6 feet	*6.0*	*2.6*
TDH	*58.1'*	*25.2*

All these calculations have been based on ideal "new" pipe, fittings, and equipment. Older systems may have "algae, hard mineral scale, or muck build-up" on the piping walls, filters, strainers, valves, elbows, heat exchangers, etc., making the published numbers too low. The smoothness coefficient is no longer valid, and neither is the inside diameter of the pipe. In other words, the TDH pump head can in reality be much higher than calculated.

Another way of determining the TDH is to measure it, if your existing pump is working. You install a flow meter, a vacuum gauge on the suction side of the pump, and a pressure gauge on the discharge side of the pump. Every inch of mercury on the vacuum gauge is multiplied by 1.13 feet of head to get the suction head. Every PSI on the pressure gauge is multiplied by 2.31 feet of head to get the discharge head. Then you add those two numbers together to get the TDH, at your existing flow rate.

V. Determining the best pump that will give you the proper flow at your pump head

Now we know the flow rate we want is 3,333 GPH or 55.5 GPM, and the Total Dynamic Head (TDH) for our pond design is 58.1 feet of pump head.

Our next step is to check out the various performance curves for available pumps. Graph One is a typical performance curve. We find 55.5 GPM on the X or bottom axis, and draw a line up. Then we find 58.1 feet of pump head on the Y or side axis, and draw a line to the right. Where they meet is the pump that we want.

In this case we want a pump that is a little less than a 1 horsepower pump. Our next step is to find the most efficient pump for our conditions. The most efficient pump will be the one with the highest Creech Pump Index (GPM x TDH / Watts), and if they have the same CPI, then the lowest amps. If we can find a variable speed pump, like the Money Saver Pump®, we can dial the horsepower and amps down to exactly where we need to be, and save money. This is especially true when our GPM and TDH point falls well below the horsepower we need. We are not using a pump that is too large because now we can dial it down to the proper size. It is like having a pump with a gas pedal, which does not need to be pushed to the floor all of the time. When we let up on the gas pedal, we save money.

One thing to avoid is picking a pump with no "head" room. We want to make sure that we are not too close to the maximum pump head, in case we have not allowed for "dirty" pipes, fittings, etc., which eventually could result in no flow at all. The gas pedal allows for real world changes, and system additions and expansions.

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Koi Show Committee Meeting

We talked about Debby Young of AKCA giving us the koi show computer program that can run the English style show, which we selected. Program is capable of digital photo input. All fees, classes, sizes and awards can be easily customized to our show's needs and has full tracking of vendor and banquet information.

The members of the committee will meet at Reagan Nursery on Saturday at 10:00 AM on May 17, 2003. Sharon of Reagan will give us a tour of where we would hold the show. She would allow vendors to sell Koi, koi food and accessories but not water plants, pumps and preformed ponds. We will discuss with her whether the club would be assessed a fixed charge or percent of Vendor Sales for the use of their facilities.

Janet informed everyone that Grant Fujita agreed to be the head judge together with Larry Gill as associate judge. Lucia will be talking to Bob Finnegan to discuss about other judging requirements.

Phred will, as a courtesy, extend an open invitation to both the Camellia Koi Club and the Santa Clara Koi Club to join us in this show. Members of their club can enter their Koi in the show.

We assigned a fellow member to take charge of one of the following:

a. Tank/Equipment including set up and breakdown, setting up water and air pumps, netting, blue tubs, fishnets, and measuring device for sizing koi. We agreed to pay people for the setup and breakdown of which Sheila suggested her kids/friends might be able to do it. Janet will explore the possibility of asking Rick Blazo, Jim Krudwig, Harley, Ray Laval and Emilio Bautista if they can assist. Janet will do an inventory of our equipment at the Storage facility and confirm with Joelan Dunkel on all outstanding loaned equipment to members. Janet, I will mail you a listing of our inventory. Janet and Ron Freer will head this subcommittee.

b. Water Quality – AmQuel, NovAqua, disinfectants, water test kit, oxygen tank, plastic bags, rubber bands, towels and netting. Sheila Jackson will head this subcommittee.

c. Administrative – tables, chairs, microphone system, registration, podium, badges, clipboards, scorecards, forms, pens, and show banners & decorations, obtain trophies, ribbons & certificates. Elaine Jackson and Joan Hishida will join forces to head this subcommittee.

d. Judges – accommodation and entertainment (lunch & dinner arrangement) including scorekeeping. Lucia will ask Eddie Cheung if he can handle this function. Lucia Rose will oversee this subcommittee.

e. Membership/Registration Booth – club information, membership forms, club merchandise for sale (pins, shirts, magazine subscriptions), send out information packets to club members who wants to enter their fish, receive and collect members Koi entry fee. Charmagne Nogue will head this subcommittee.

f. Public Relations – announcements on newspaper & magazines, flyers and posters, taking digital photos/camera, Polaroid camera for Koi winners, koi show signs and direction signs. Inform AKCA and KoiUSA about the show. Sheila will ask whether David Muth can assist. Sheila Jackson and Lucia Rose will co-chair this subcommittee.

g. Computer Program – will run the program and produce all needed reports like scorekeeping sheets, list of winners, and badges. Will input judge's scores and digital photos. Phred Jackson will head this subcommittee.

h. Lectures and mini seminars – will invite guests to talk about Koi husbandry, diseases, nutrition, koi selection, koi classification, etc. Ask Reagan to give a talk about water plant and its care. Tom Remigio will bring TV with VCR to play tapes on Koi. Lucia will ask Kathleen Krudwig to assist in this project. Lucia Rose will head this subcommittee.

i. Vendor Relations – will ask koi dealers if they would like to display and/or sell their koi at the show, will be in-charge of sending out information packets to vendors, record vendor registration and collection of entry fee from vendors. Will solicit vendors for raffle donations. Lucia Rose will also head this subcommittee.

j. Budget – develop the financial requirement of the show. Tom Remigio will head this subcommittee.

k. Banquet – explore the place to hold diner. Janet Freer will head this subcommittee.

l. Fish Handler and Raffles. Lee Nogue and Ron Freer will co-chair this subcommittee. Will assists to net fish, as Judges needs them. Will assist the person in-charge of benching in measuring and classifying Koi.

m. Benching – will be responsible in determining the class, size of Koi being entered. Janet will ask Emilo Bautista if he is willing to do this function. Janet Freer will oversee this subcommittee.

I would strongly encourage all subcommittee chairpersons to solicit help from other club members, relatives and friends. Also, please do not limit yourself on your assigned task. If you feel you could contribute something to the other subcommittees, please do so. This is a group/team effort and we need all hands, lots of hands, to make this show a success!

My personal apology to Elaine Jackson for failing to include her name in my first e-mail to the Koi Show committee members. It was just an oversight! Sorry Elaine!

I will all see you at Reagan's on June 17 at 10:00 AM.

Thank you for your effort and support.

Tom Remigio

Koi Show Chairman

- **May 24, Kathy Albrecht, 772 North St, Pescadero, 650.879.1957; Rich Little presents Pump Selection.**

11:00-noon	*Board Meeting*
noon-1:00	*Networking•Grazing•Socializing-bring finger food*
1:00-?	*• Program: Rich Little: Pump Selection*

- **May 17 - Central [Fresno] Pond Tour; Contact: Narvel Conners, 559.432.5882**

- **June 7 - Santa Clara Pond Tour; Contact: Terry Denevan at (408) 279-4567**

- **June 21 [Note Date] Tom Jorde, Diablo; Fernando Ibanez, Bio Filtration**

- **June 26-29**
22nd AKCA Seminar, Atlanta, GA, Contact: Nong Tarlton, 847.381.9203

- **July 19 - SFBAKC Pond Tour, Contra Costa County East • Delta Wonderland**

- From 880 or 101 go to Highway 92 heading west and take it to Highway 1 So.
- Left (east) onto Pescadero Rd. (There will be a sign, a flashing yellow light, a turn lane, and you will have just passed the marsh on your left).
- Left on Stage Rd [abt 2 mi].
- Right on North Street.

We are the 5 th house on the left (2 story gray).