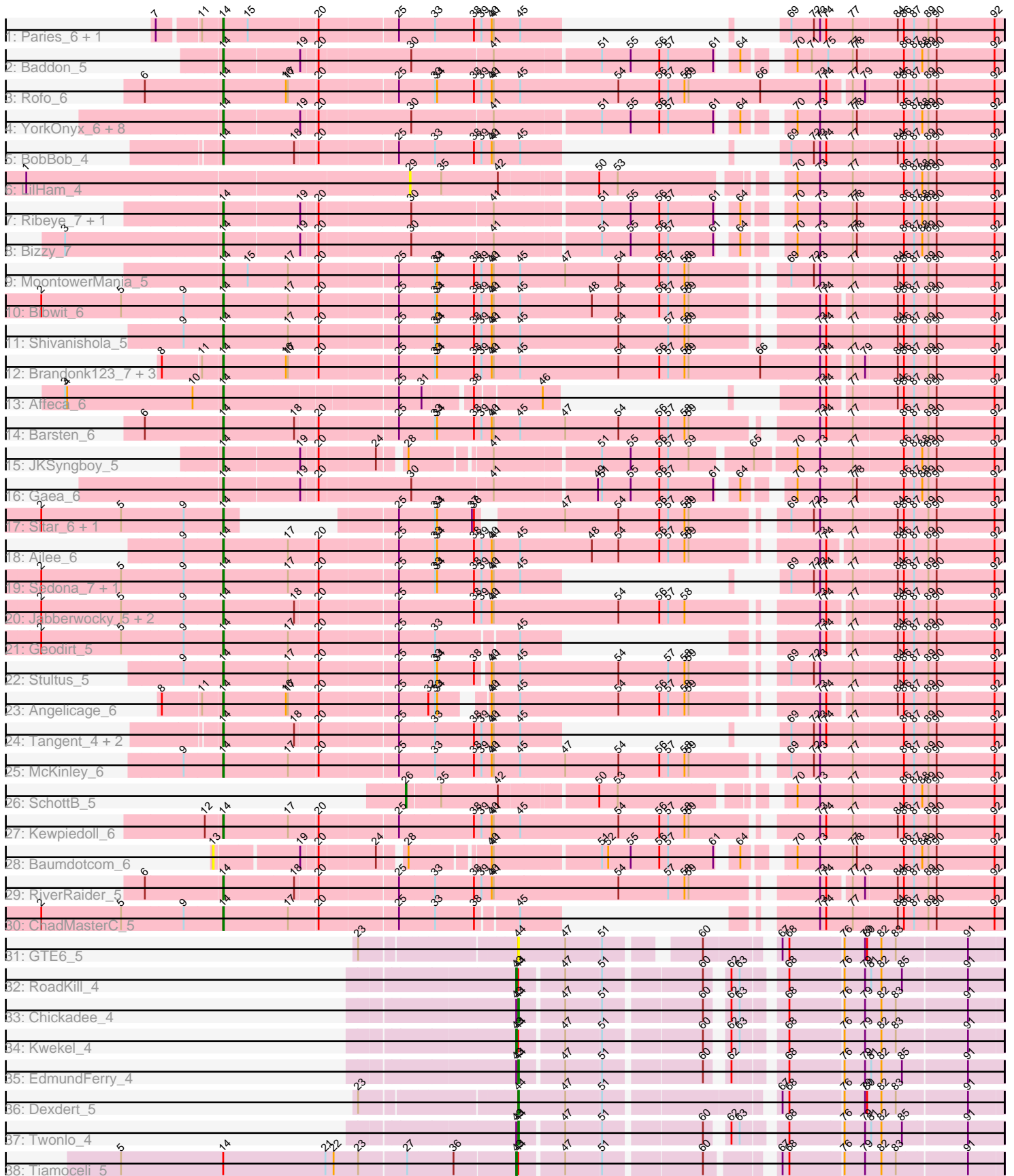


Pham 194036



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 194036 Report

This analysis was run 11/02/24 on database version 579.

Pham number 194036 has 57 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Paries\_6, Galadriel\_7
- Track 2 : Baddon\_5
- Track 3 : Rofo\_6
- Track 4 : YorkOnyx\_6, Tycho\_6, Flatwoods\_7, Gustavo\_6, Kroos\_6, Ashertheman\_6, Saronaya\_6, Tangerine\_6, Kwobi\_6
- Track 5 : BobBob\_4
- Track 6 : LilHam\_4
- Track 7 : Ribeye\_7, StorminNorm\_6
- Track 8 : Bizzy\_7
- Track 9 : MoontowerMania\_5
- Track 10 : Bibwit\_6
- Track 11 : Shivanishola\_5
- Track 12 : Brandonk123\_7, Love\_7, Thing3\_6, Kamashten\_6
- Track 13 : Affeca\_6
- Track 14 : Barsten\_6
- Track 15 : JKSyngboy\_5
- Track 16 : Gaea\_6
- Track 17 : Sitar\_6, Lennon\_6
- Track 18 : Ailee\_6
- Track 19 : Sedona\_7, Keitabear\_6
- Track 20 : Jabberwocky\_5, Fitzgerald\_5, Sanjuju\_5
- Track 21 : Geodirt\_5
- Track 22 : Stultus\_5
- Track 23 : Angelicage\_6
- Track 24 : Tangent\_4, Charming\_4, Fosterous\_4
- Track 25 : McKinley\_6
- Track 26 : SchottB\_5
- Track 27 : Kewpiedoll\_6
- Track 28 : Baumdotcom\_6
- Track 29 : RiverRaider\_5
- Track 30 : ChadMasterC\_5
- Track 31 : GTE6\_5
- Track 32 : RoadKill\_4
- Track 33 : Chickadee\_4
- Track 34 : Kwekel\_4
- Track 35 : EdmundFerry\_4
- Track 36 : Dxdert\_5

- Track 37 : Twonlo\_4
- Track 38 : Tiamoceli\_5

### **Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 14, it was called in 41 of the 49 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Affeca\_6, Ailee\_6, Angelicage\_6, Ashertheman\_6, Baddon\_5, Barsten\_6, Bibwit\_6, Bizzy\_7, BobBob\_4, Brandonk123\_7, ChadMasterC\_5, Charming\_4, Fitzgerald\_5, Flatwoods\_7, Fosterous\_4, Gaea\_6, Galadriel\_7, Geodirt\_5, Gustavo\_6, JKSyngboy\_5, Jabberwocky\_5, Kamashten\_6, Keitabear\_6, Kewpiedoll\_6, Kroos\_6, Kwobi\_6, Lennon\_6, Love\_7, McKinley\_6, MoontowerMania\_5, Paries\_6, Ribeye\_7, RiverRaider\_5, Rofo\_6, Sanjuju\_5, Saronaya\_6, Sedona\_7, Shivanishola\_5, Sitar\_6, StorminNorm\_6, Stultus\_5, Tangent\_4, Tangerine\_6, Thing3\_6, Tycho\_6, YorkOnyx\_6,

Genes that have the "Most Annotated" start but do not call it:

- Tiamoceli\_5,

Genes that do not have the "Most Annotated" start:

- Baumdotcom\_6, Chickadee\_4, Dexdert\_5, EdmundFerry\_4, GTE6\_5, Kwekel\_4, LilHam\_4, RoadKill\_4, SchottB\_5, Twonlo\_4,

### **Summary by start number:**

Start 13:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Baumdotcom\_6 (DE1),

Start 14:

- Found in 47 of 57 ( 82.5% ) of genes in pham
- Manual Annotations of this start: 41 of 49
- Called 97.9% of time when present
- Phage (with cluster) where this start called: Affeca\_6 (DE1), Ailee\_6 (DE1), Angelicage\_6 (DE1), Ashertheman\_6 (DE1), Baddon\_5 (DE1), Barsten\_6 (DE1), Bibwit\_6 (DE1), Bizzy\_7 (DE1), BobBob\_4 (DE1), Brandonk123\_7 (DE1), ChadMasterC\_5 (DE1), Charming\_4 (DE1), Fitzgerald\_5 (DE1), Flatwoods\_7 (DE1), Fosterous\_4 (DE1), Gaea\_6 (DE1), Galadriel\_7 (DE1), Geodirt\_5 (DE1), Gustavo\_6 (DE1), JKSyngboy\_5 (DE1), Jabberwocky\_5 (DE1), Kamashten\_6 (DE1), Keitabear\_6 (DE1), Kewpiedoll\_6 (DE1), Kroos\_6 (DE1), Kwobi\_6 (DE1), Lennon\_6 (DE1), Love\_7 (DE1), McKinley\_6 (DE1), MoontowerMania\_5 (DE1), Paries\_6 (DE1), Ribeye\_7 (DE1), RiverRaider\_5 (DE1), Rofo\_6 (DE1), Sanjuju\_5 (DE1), Saronaya\_6 (DE1), Sedona\_7 (DE1), Shivanishola\_5 (DE1), Sitar\_6 (DE1), StorminNorm\_6 (DE1), Stultus\_5 (DE1), Tangent\_4 (DE1), Tangerine\_6 (DE1), Thing3\_6 (DE1), Tycho\_6 (DE1), YorkOnyx\_6 (DE1),

Start 26:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 1 of 49
- Called 100.0% of time when present
- Phage (with cluster) where this start called: SchottB\_5 (DE1),

Start 29:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilHam\_4 (DE1),

Start 43:

- Found in 6 of 57 ( 10.5% ) of genes in pham
- Manual Annotations of this start: 3 of 49
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Kwekel\_4 (DE3), RoadKill\_4 (DE3), Tiamoceli\_5 (DE3),

Start 44:

- Found in 8 of 57 ( 14.0% ) of genes in pham
- Manual Annotations of this start: 4 of 49
- Called 62.5% of time when present
- Phage (with cluster) where this start called: Chickadee\_4 (DE3), Dexdert\_5 (DE3), EdmundFerry\_4 (DE3), GTE6\_5 (DE3), Twonlo\_4 (DE3),

**Summary by clusters:**

There are 2 clusters represented in this pham: DE1, DE3,

Info for manual annotations of cluster DE1:

- Start number 14 was manually annotated 41 times for cluster DE1.
- Start number 26 was manually annotated 1 time for cluster DE1.

Info for manual annotations of cluster DE3:

- Start number 43 was manually annotated 3 times for cluster DE3.
- Start number 44 was manually annotated 4 times for cluster DE3.

**Gene Information:**

Gene: Affeca\_6 Start: 3776, Stop: 4534, Start Num: 14

Candidate Starts for Affeca\_6:

(3, 3548), (4, 3551), (10, 3734), (Start: 14 @3776 has 41 MA's), (25, 4016), (31, 4049), (38, 4109), (46, 4193), (73, 4280), (74, 4289), (77, 4319), (84, 4382), (86, 4391), (87, 4406), (89, 4427), (90, 4439), (92, 4523),

Gene: Ailee\_6 Start: 4306, Stop: 5376, Start Num: 14

Candidate Starts for Ailee\_6:

(9, 4249), (Start: 14 @4306 has 41 MA's), (17, 4399), (20, 4441), (25, 4552), (33, 4603), (34, 4606), (38, 4660), (39, 4669), (40, 4684), (41, 4687), (45, 4726), (48, 4828), (54, 4867), (56, 4927), (57, 4939), (58, 4963), (59, 4969), (73, 5122), (74, 5131), (77, 5161), (84, 5224), (86, 5233), (87, 5248),

(89, 5269), (90, 5281), (92, 5365),

Gene: Angelicage\_6 Start: 3903, Stop: 4943, Start Num: 14

Candidate Starts for Angelicage\_6:

(8, 3822), (11, 3876), (Start: 14 @3903 has 41 MA's), (16, 3993), (17, 3996), (20, 4038), (25, 4149), (32, 4191), (33, 4200), (34, 4203), (40, 4251), (41, 4254), (45, 4293), (54, 4434), (56, 4494), (57, 4506), (58, 4530), (59, 4536), (73, 4689), (74, 4698), (77, 4728), (84, 4791), (86, 4800), (87, 4815), (89, 4836), (90, 4848), (92, 4932),

Gene: Ashertheman\_6 Start: 3009, Stop: 4040, Start Num: 14

Candidate Starts for Ashertheman\_6:

(Start: 14 @3009 has 41 MA's), (19, 3114), (20, 3135), (30, 3261), (41, 3375), (51, 3519), (55, 3558), (56, 3600), (57, 3612), (61, 3678), (64, 3696), (70, 3744), (73, 3777), (77, 3825), (78, 3831), (86, 3897), (87, 3912), (88, 3924), (89, 3933), (90, 3945), (92, 4029),

Gene: Baddon\_5 Start: 3646, Stop: 4677, Start Num: 14

Candidate Starts for Baddon\_5:

(Start: 14 @3646 has 41 MA's), (19, 3751), (20, 3772), (30, 3898), (41, 4012), (51, 4156), (55, 4195), (56, 4237), (57, 4249), (61, 4315), (64, 4333), (70, 4381), (71, 4402), (75, 4426), (77, 4462), (78, 4468), (86, 4534), (87, 4549), (88, 4561), (89, 4570), (90, 4582), (92, 4666),

Gene: Barsten\_6 Start: 2980, Stop: 4056, Start Num: 14

Candidate Starts for Barsten\_6:

(6, 2869), (Start: 14 @2980 has 41 MA's), (18, 3082), (20, 3112), (25, 3223), (33, 3274), (34, 3277), (38, 3331), (39, 3340), (40, 3355), (41, 3358), (45, 3397), (47, 3460), (54, 3538), (56, 3598), (57, 3610), (58, 3634), (59, 3640), (73, 3793), (74, 3802), (77, 3841), (86, 3913), (87, 3928), (89, 3949), (90, 3961), (92, 4045),

Gene: Baumdotcom\_6 Start: 3056, Stop: 4063, Start Num: 13

Candidate Starts for Baumdotcom\_6:

(13, 3056), (19, 3167), (20, 3188), (24, 3266), (28, 3296), (40, 3392), (41, 3395), (51, 3542), (52, 3551), (55, 3581), (56, 3623), (57, 3635), (61, 3701), (64, 3719), (70, 3767), (73, 3800), (77, 3848), (78, 3854), (86, 3920), (87, 3935), (88, 3947), (89, 3956), (90, 3968), (92, 4052),

Gene: Bibwit\_6 Start: 4139, Stop: 5209, Start Num: 14

Candidate Starts for Bibwit\_6:

(2, 3875), (5, 3992), (9, 4082), (Start: 14 @4139 has 41 MA's), (17, 4232), (20, 4274), (25, 4385), (33, 4436), (34, 4439), (38, 4493), (39, 4502), (40, 4517), (41, 4520), (45, 4559), (48, 4661), (54, 4700), (56, 4760), (57, 4772), (58, 4796), (59, 4802), (73, 4955), (74, 4964), (77, 4994), (84, 5057), (86, 5066), (87, 5081), (89, 5102), (90, 5114), (92, 5198),

Gene: Bizzy\_7 Start: 3206, Stop: 4237, Start Num: 14

Candidate Starts for Bizzy\_7:

(3, 2984), (Start: 14 @3206 has 41 MA's), (19, 3311), (20, 3332), (30, 3458), (41, 3572), (51, 3716), (55, 3755), (56, 3797), (57, 3809), (61, 3875), (64, 3893), (70, 3941), (73, 3974), (77, 4022), (78, 4028), (86, 4094), (87, 4109), (88, 4121), (89, 4130), (90, 4142), (92, 4226),

Gene: BobBob\_4 Start: 3078, Stop: 3878, Start Num: 14

Candidate Starts for BobBob\_4:

(Start: 14 @3078 has 41 MA's), (18, 3180), (20, 3210), (25, 3321), (33, 3372), (38, 3429), (39, 3438), (40, 3453), (41, 3456), (45, 3495), (69, 3573), (72, 3606), (73, 3615), (74, 3624), (77, 3663), (84, 3726), (86, 3735), (87, 3750), (89, 3771), (90, 3783), (92, 3867),

Gene: Brandonk123\_7 Start: 3107, Stop: 4216, Start Num: 14

Candidate Starts for Brandonk123\_7:

(8, 3026), (11, 3080), (Start: 14 @3107 has 41 MA's), (16, 3197), (17, 3200), (20, 3242), (25, 3353), (33, 3404), (34, 3407), (38, 3461), (39, 3470), (40, 3485), (41, 3488), (45, 3527), (54, 3668), (56, 3728), (57, 3740), (58, 3764), (59, 3770), (66, 3875), (73, 3962), (74, 3971), (77, 4001), (79, 4019), (84, 4064), (86, 4073), (87, 4088), (89, 4109), (90, 4121), (92, 4205),

Gene: ChadMasterC\_5 Start: 3596, Stop: 4417, Start Num: 14

Candidate Starts for ChadMasterC\_5:

(2, 3332), (5, 3449), (9, 3539), (Start: 14 @3596 has 41 MA's), (17, 3689), (20, 3731), (25, 3842), (33, 3893), (38, 3950), (45, 4004), (73, 4154), (74, 4163), (77, 4202), (84, 4265), (86, 4274), (87, 4289), (89, 4310), (90, 4322), (92, 4406),

Gene: Charming\_4 Start: 3078, Stop: 3878, Start Num: 14

Candidate Starts for Charming\_4:

(Start: 14 @3078 has 41 MA's), (18, 3180), (20, 3210), (25, 3321), (33, 3372), (38, 3429), (39, 3438), (40, 3453), (41, 3456), (45, 3495), (69, 3573), (72, 3606), (73, 3615), (74, 3624), (77, 3663), (86, 3735), (87, 3750), (89, 3771), (90, 3783), (92, 3867),

Gene: Chickadee\_4 Start: 2419, Stop: 3039, Start Num: 44

Candidate Starts for Chickadee\_4:

(Start: 43 @2416 has 3 MA's), (Start: 44 @2419 has 4 MA's), (47, 2479), (51, 2530), (60, 2662), (62, 2683), (63, 2692), (68, 2743), (76, 2818), (79, 2848), (82, 2872), (83, 2893), (91, 2989),

Gene: Dextert\_5 Start: 2859, Stop: 3503, Start Num: 44

Candidate Starts for Dextert\_5:

(23, 2649), (Start: 44 @2859 has 4 MA's), (47, 2928), (51, 2979), (67, 3198), (68, 3207), (76, 3282), (79, 3312), (80, 3315), (82, 3336), (83, 3357), (91, 3453),

Gene: EdmundFerry\_4 Start: 2419, Stop: 3042, Start Num: 44

Candidate Starts for EdmundFerry\_4:

(Start: 43 @2416 has 3 MA's), (Start: 44 @2419 has 4 MA's), (47, 2479), (51, 2530), (60, 2662), (62, 2683), (68, 2743), (76, 2818), (79, 2848), (81, 2857), (82, 2872), (85, 2902), (91, 2989),

Gene: Fitzgerald\_5 Start: 3728, Stop: 4804, Start Num: 14

Candidate Starts for Fitzgerald\_5:

(2, 3464), (5, 3581), (9, 3671), (Start: 14 @3728 has 41 MA's), (18, 3830), (20, 3860), (25, 3971), (38, 4079), (39, 4088), (40, 4103), (41, 4106), (54, 4286), (56, 4346), (57, 4358), (58, 4382), (73, 4541), (74, 4550), (77, 4589), (84, 4652), (86, 4661), (87, 4676), (89, 4697), (90, 4709), (92, 4793),

Gene: Flatwoods\_7 Start: 3206, Stop: 4237, Start Num: 14

Candidate Starts for Flatwoods\_7:

(Start: 14 @3206 has 41 MA's), (19, 3311), (20, 3332), (30, 3458), (41, 3572), (51, 3716), (55, 3755), (56, 3797), (57, 3809), (61, 3875), (64, 3893), (70, 3941), (73, 3974), (77, 4022), (78, 4028), (86, 4094), (87, 4109), (88, 4121), (89, 4130), (90, 4142), (92, 4226),

Gene: Fosterous\_4 Start: 3078, Stop: 3878, Start Num: 14

Candidate Starts for Fosterous\_4:

(Start: 14 @3078 has 41 MA's), (18, 3180), (20, 3210), (25, 3321), (33, 3372), (38, 3429), (39, 3438), (40, 3453), (41, 3456), (45, 3495), (69, 3573), (72, 3606), (73, 3615), (74, 3624), (77, 3663), (86, 3735), (87, 3750), (89, 3771), (90, 3783), (92, 3867),

Gene: GTE6\_5 Start: 2923, Stop: 3546, Start Num: 44

Candidate Starts for GTE6\_5:

(23, 2713), (Start: 44 @2923 has 4 MA's), (47, 2992), (51, 3043), (60, 3154), (67, 3241), (68, 3250), (76, 3325), (79, 3355), (80, 3358), (82, 3379), (83, 3400), (91, 3496),

Gene: Gaea\_6 Start: 3012, Stop: 4043, Start Num: 14

Candidate Starts for Gaea\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (49, 3516), (51, 3522), (55, 3561), (56, 3603), (57, 3615), (61, 3681), (64, 3699), (70, 3747), (73, 3780), (77, 3828), (78, 3834), (86, 3900), (87, 3915), (88, 3927), (89, 3936), (90, 3948), (92, 4032),

Gene: Galadriel\_7 Start: 3107, Stop: 3907, Start Num: 14

Candidate Starts for Galadriel\_7:

(7, 3026), (11, 3080), (Start: 14 @3107 has 41 MA's), (15, 3143), (20, 3239), (25, 3350), (33, 3401), (38, 3458), (39, 3467), (40, 3482), (41, 3485), (45, 3524), (69, 3602), (72, 3635), (73, 3644), (74, 3653), (77, 3692), (84, 3755), (86, 3764), (87, 3779), (89, 3800), (90, 3812), (92, 3896),

Gene: Geodirt\_5 Start: 3648, Stop: 4460, Start Num: 14

Candidate Starts for Geodirt\_5:

(2, 3384), (5, 3501), (9, 3591), (Start: 14 @3648 has 41 MA's), (17, 3741), (20, 3783), (25, 3894), (33, 3945), (45, 4056), (73, 4206), (74, 4215), (77, 4245), (84, 4308), (86, 4317), (87, 4332), (89, 4353), (90, 4365), (92, 4449),

Gene: Gustavo\_6 Start: 3012, Stop: 4040, Start Num: 14

Candidate Starts for Gustavo\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3519), (55, 3558), (56, 3600), (57, 3612), (61, 3678), (64, 3696), (70, 3744), (73, 3777), (77, 3825), (78, 3831), (86, 3897), (87, 3912), (88, 3924), (89, 3933), (90, 3945), (92, 4029),

Gene: JKSyngboy\_5 Start: 3640, Stop: 4671, Start Num: 14

Candidate Starts for JKSyngboy\_5:

(Start: 14 @3640 has 41 MA's), (19, 3745), (20, 3766), (24, 3844), (28, 3874), (41, 3973), (51, 4117), (55, 4156), (56, 4198), (57, 4210), (59, 4240), (65, 4321), (70, 4375), (73, 4408), (77, 4456), (86, 4528), (87, 4543), (88, 4555), (89, 4564), (90, 4576), (92, 4660),

Gene: Jabberwocky\_5 Start: 3728, Stop: 4795, Start Num: 14

Candidate Starts for Jabberwocky\_5:

(2, 3464), (5, 3581), (9, 3671), (Start: 14 @3728 has 41 MA's), (18, 3830), (20, 3860), (25, 3971), (38, 4079), (39, 4088), (40, 4103), (41, 4106), (54, 4286), (56, 4346), (57, 4358), (58, 4382), (73, 4541), (74, 4550), (77, 4580), (84, 4643), (86, 4652), (87, 4667), (89, 4688), (90, 4700), (92, 4784),

Gene: Kamashten\_6 Start: 3108, Stop: 4217, Start Num: 14

Candidate Starts for Kamashten\_6:

(8, 3027), (11, 3081), (Start: 14 @3108 has 41 MA's), (16, 3198), (17, 3201), (20, 3243), (25, 3354), (33, 3405), (34, 3408), (38, 3462), (39, 3471), (40, 3486), (41, 3489), (45, 3528), (54, 3669), (56, 3729), (57, 3741), (58, 3765), (59, 3771), (66, 3876), (73, 3963), (74, 3972), (77, 4002), (79, 4020), (84, 4065), (86, 4074), (87, 4089), (89, 4110), (90, 4122), (92, 4206),

Gene: Keitabear\_6 Start: 5048, Stop: 5851, Start Num: 14

Candidate Starts for Keitabear\_6:

(2, 4784), (5, 4901), (9, 4991), (Start: 14 @5048 has 41 MA's), (17, 5141), (20, 5183), (25, 5294), (33, 5345), (34, 5348), (38, 5402), (39, 5411), (40, 5426), (41, 5429), (45, 5468), (69, 5546), (72, 5579), (73, 5588), (74, 5597), (77, 5636), (84, 5699), (86, 5708), (87, 5723), (89, 5744), (90, 5756), (92, 5840),

Gene: Kewpiedoll\_6 Start: 2983, Stop: 4062, Start Num: 14

Candidate Starts for Kewpiedoll\_6:

(12, 2959), (Start: 14 @2983 has 41 MA's), (17, 3076), (20, 3118), (25, 3229), (38, 3337), (39, 3346), (40, 3361), (41, 3364), (45, 3403), (54, 3544), (56, 3604), (57, 3616), (58, 3640), (59, 3646), (73, 3799), (74, 3808), (77, 3847), (84, 3910), (86, 3919), (87, 3934), (89, 3955), (90, 3967), (92, 4051),

Gene: Kroos\_6 Start: 3173, Stop: 4204, Start Num: 14

Candidate Starts for Kroos\_6:

(Start: 14 @3173 has 41 MA's), (19, 3278), (20, 3299), (30, 3425), (41, 3539), (51, 3683), (55, 3722), (56, 3764), (57, 3776), (61, 3842), (64, 3860), (70, 3908), (73, 3941), (77, 3989), (78, 3995), (86, 4061), (87, 4076), (88, 4088), (89, 4097), (90, 4109), (92, 4193),

Gene: Kwekel\_4 Start: 2416, Stop: 3039, Start Num: 43

Candidate Starts for Kwekel\_4:

(Start: 43 @2416 has 3 MA's), (Start: 44 @2419 has 4 MA's), (47, 2479), (51, 2530), (60, 2662), (62, 2683), (63, 2692), (68, 2743), (76, 2818), (79, 2848), (82, 2872), (83, 2893), (91, 2989),

Gene: Kwobi\_6 Start: 3012, Stop: 4043, Start Num: 14

Candidate Starts for Kwobi\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3522), (55, 3561), (56, 3603), (57, 3615), (61, 3681), (64, 3699), (70, 3747), (73, 3780), (77, 3828), (78, 3834), (86, 3900), (87, 3915), (88, 3927), (89, 3936), (90, 3948), (92, 4032),

Gene: Lennon\_6 Start: 4140, Stop: 5048, Start Num: 14

Candidate Starts for Lennon\_6:

(2, 3876), (5, 3993), (9, 4083), (Start: 14 @4140 has 41 MA's), (25, 4245), (33, 4296), (34, 4299), (37, 4347), (38, 4350), (47, 4452), (54, 4530), (56, 4590), (57, 4602), (58, 4626), (59, 4632), (69, 4743), (72, 4776), (73, 4785), (77, 4833), (84, 4896), (86, 4905), (87, 4920), (89, 4941), (90, 4953), (92, 5037),

Gene: LilHam\_4 Start: 2583, Stop: 3359, Start Num: 29

Candidate Starts for LilHam\_4:

(1, 2040), (29, 2583), (35, 2628), (42, 2709), (50, 2835), (53, 2859), (70, 3063), (73, 3096), (77, 3144), (86, 3216), (87, 3231), (88, 3243), (89, 3252), (90, 3264), (92, 3348),

Gene: Love\_7 Start: 3107, Stop: 4216, Start Num: 14

Candidate Starts for Love\_7:

(8, 3026), (11, 3080), (Start: 14 @3107 has 41 MA's), (16, 3197), (17, 3200), (20, 3242), (25, 3353), (33, 3404), (34, 3407), (38, 3461), (39, 3470), (40, 3485), (41, 3488), (45, 3527), (54, 3668), (56, 3728), (57, 3740), (58, 3764), (59, 3770), (66, 3875), (73, 3962), (74, 3971), (77, 4001), (79, 4019), (84, 4064), (86, 4073), (87, 4088), (89, 4109), (90, 4121), (92, 4205),

Gene: McKinley\_6 Start: 3980, Stop: 5059, Start Num: 14

Candidate Starts for McKinley\_6:

(9, 3923), (Start: 14 @3980 has 41 MA's), (17, 4073), (20, 4115), (25, 4226), (33, 4277), (38, 4334), (39, 4343), (40, 4358), (41, 4361), (45, 4400), (47, 4463), (54, 4541), (56, 4601), (57, 4613), (58, 4637), (59, 4643), (69, 4754), (72, 4787), (73, 4796), (77, 4844), (86, 4916), (87, 4931), (89, 4952), (90, 4964), (92, 5048),

Gene: MoontowerMania\_5 Start: 2725, Stop: 3804, Start Num: 14

Candidate Starts for MoontowerMania\_5:



(Start: 14 @2725 has 41 MA's), (15, 2761), (17, 2818), (20, 2860), (25, 2971), (33, 3022), (34, 3025), (38, 3079), (39, 3088), (40, 3103), (41, 3106), (45, 3145), (47, 3208), (54, 3286), (56, 3346), (57, 3358), (58, 3382), (59, 3388), (69, 3499), (72, 3532), (73, 3541), (77, 3589), (84, 3652), (86, 3661), (87, 3676), (89, 3697), (90, 3709), (92, 3793),

Gene: Paries\_6 Start: 3108, Stop: 3908, Start Num: 14

Candidate Starts for Paries\_6:

(7, 3027), (11, 3081), (Start: 14 @3108 has 41 MA's), (15, 3144), (20, 3240), (25, 3351), (33, 3402), (38, 3459), (39, 3468), (40, 3483), (41, 3486), (45, 3525), (69, 3603), (72, 3636), (73, 3645), (74, 3654), (77, 3693), (84, 3756), (86, 3765), (87, 3780), (89, 3801), (90, 3813), (92, 3897),

Gene: Ribeye\_7 Start: 3207, Stop: 4238, Start Num: 14

Candidate Starts for Ribeye\_7:

(Start: 14 @3207 has 41 MA's), (19, 3312), (20, 3333), (30, 3459), (41, 3573), (51, 3717), (55, 3756), (56, 3798), (57, 3810), (61, 3876), (64, 3894), (70, 3942), (73, 3975), (77, 4023), (78, 4029), (86, 4095), (87, 4110), (88, 4122), (89, 4131), (90, 4143), (92, 4227),

Gene: RiverRaider\_5 Start: 2737, Stop: 3804, Start Num: 14

Candidate Starts for RiverRaider\_5:

(6, 2626), (Start: 14 @2737 has 41 MA's), (18, 2839), (20, 2869), (25, 2980), (33, 3031), (38, 3088), (39, 3097), (40, 3112), (41, 3115), (54, 3295), (57, 3367), (58, 3391), (59, 3397), (73, 3550), (74, 3559), (77, 3589), (79, 3607), (84, 3652), (86, 3661), (87, 3676), (89, 3697), (90, 3709), (92, 3793),

Gene: RoadKill\_4 Start: 2416, Stop: 3042, Start Num: 43

Candidate Starts for RoadKill\_4:

(Start: 43 @2416 has 3 MA's), (Start: 44 @2419 has 4 MA's), (47, 2479), (51, 2530), (60, 2662), (62, 2683), (63, 2692), (68, 2743), (76, 2818), (79, 2848), (81, 2857), (82, 2872), (85, 2902), (91, 2989),

Gene: Rofo\_6 Start: 3776, Stop: 4885, Start Num: 14

Candidate Starts for Rofo\_6:

(6, 3665), (Start: 14 @3776 has 41 MA's), (16, 3866), (17, 3869), (20, 3911), (25, 4022), (33, 4073), (34, 4076), (38, 4130), (39, 4139), (40, 4154), (41, 4157), (45, 4196), (54, 4337), (56, 4397), (57, 4409), (58, 4433), (59, 4439), (66, 4544), (73, 4631), (74, 4640), (77, 4670), (79, 4688), (84, 4733), (86, 4742), (87, 4757), (89, 4778), (90, 4790), (92, 4874),

Gene: Sanjuju\_5 Start: 3766, Stop: 4833, Start Num: 14

Candidate Starts for Sanjuju\_5:

(2, 3502), (5, 3619), (9, 3709), (Start: 14 @3766 has 41 MA's), (18, 3868), (20, 3898), (25, 4009), (38, 4117), (39, 4126), (40, 4141), (41, 4144), (54, 4324), (56, 4384), (57, 4396), (58, 4420), (73, 4579), (74, 4588), (77, 4618), (84, 4681), (86, 4690), (87, 4705), (89, 4726), (90, 4738), (92, 4822),

Gene: Saronaya\_6 Start: 3012, Stop: 4040, Start Num: 14

Candidate Starts for Saronaya\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3519), (55, 3558), (56, 3600), (57, 3612), (61, 3678), (64, 3696), (70, 3744), (73, 3777), (77, 3825), (78, 3831), (86, 3897), (87, 3912), (88, 3924), (89, 3933), (90, 3945), (92, 4029),

Gene: SchottB\_5 Start: 3650, Stop: 4426, Start Num: 26

Candidate Starts for SchottB\_5:

(Start: 26 @3650 has 1 MA's), (35, 3695), (42, 3776), (50, 3902), (53, 3926), (70, 4130), (73, 4163), (77, 4211), (86, 4283), (87, 4298), (88, 4310), (89, 4319), (90, 4331), (92, 4415),

Gene: Sedona\_7 Start: 5048, Stop: 5851, Start Num: 14

Candidate Starts for Sedona\_7:

(2, 4784), (5, 4901), (9, 4991), (Start: 14 @5048 has 41 MA's), (17, 5141), (20, 5183), (25, 5294), (33, 5345), (34, 5348), (38, 5402), (39, 5411), (40, 5426), (41, 5429), (45, 5468), (69, 5546), (72, 5579), (73, 5588), (74, 5597), (77, 5636), (84, 5699), (86, 5708), (87, 5723), (89, 5744), (90, 5756), (92, 5840),

Gene: Shivanishola\_5 Start: 3816, Stop: 4895, Start Num: 14

Candidate Starts for Shivanishola\_5:

(9, 3759), (Start: 14 @3816 has 41 MA's), (17, 3909), (20, 3951), (25, 4062), (33, 4113), (34, 4116), (38, 4170), (39, 4179), (40, 4194), (41, 4197), (45, 4236), (54, 4377), (57, 4449), (58, 4473), (59, 4479), (73, 4632), (74, 4641), (77, 4680), (84, 4743), (86, 4752), (87, 4767), (89, 4788), (90, 4800), (92, 4884),

Gene: Sitar\_6 Start: 4140, Stop: 5048, Start Num: 14

Candidate Starts for Sitar\_6:

(2, 3876), (5, 3993), (9, 4083), (Start: 14 @4140 has 41 MA's), (25, 4245), (33, 4296), (34, 4299), (37, 4347), (38, 4350), (47, 4452), (54, 4530), (56, 4590), (57, 4602), (58, 4626), (59, 4632), (69, 4743), (72, 4776), (73, 4785), (77, 4833), (84, 4896), (86, 4905), (87, 4920), (89, 4941), (90, 4953), (92, 5037),

Gene: StorminNorm\_6 Start: 3012, Stop: 4043, Start Num: 14

Candidate Starts for StorminNorm\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3522), (55, 3561), (56, 3603), (57, 3615), (61, 3681), (64, 3699), (70, 3747), (73, 3780), (77, 3828), (78, 3834), (86, 3900), (87, 3915), (88, 3927), (89, 3936), (90, 3948), (92, 4032),

Gene: Stultus\_5 Start: 3815, Stop: 4885, Start Num: 14

Candidate Starts for Stultus\_5:

(9, 3758), (Start: 14 @3815 has 41 MA's), (17, 3908), (20, 3950), (25, 4061), (33, 4112), (34, 4115), (38, 4169), (40, 4184), (41, 4187), (45, 4226), (54, 4367), (57, 4439), (58, 4463), (59, 4469), (69, 4580), (72, 4613), (73, 4622), (77, 4670), (84, 4733), (86, 4742), (87, 4757), (89, 4778), (90, 4790), (92, 4874),

Gene: Tangent\_4 Start: 3078, Stop: 3878, Start Num: 14

Candidate Starts for Tangent\_4:

(Start: 14 @3078 has 41 MA's), (18, 3180), (20, 3210), (25, 3321), (33, 3372), (38, 3429), (39, 3438), (40, 3453), (41, 3456), (45, 3495), (69, 3573), (72, 3606), (73, 3615), (74, 3624), (77, 3663), (86, 3735), (87, 3750), (89, 3771), (90, 3783), (92, 3867),

Gene: Tangerine\_6 Start: 3012, Stop: 4043, Start Num: 14

Candidate Starts for Tangerine\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3522), (55, 3561), (56, 3603), (57, 3615), (61, 3681), (64, 3699), (70, 3747), (73, 3780), (77, 3828), (78, 3834), (86, 3900), (87, 3915), (88, 3927), (89, 3936), (90, 3948), (92, 4032),

Gene: Thing3\_6 Start: 3108, Stop: 4217, Start Num: 14

Candidate Starts for Thing3\_6:

(8, 3027), (11, 3081), (Start: 14 @3108 has 41 MA's), (16, 3198), (17, 3201), (20, 3243), (25, 3354), (33, 3405), (34, 3408), (38, 3462), (39, 3471), (40, 3486), (41, 3489), (45, 3528), (54, 3669), (56, 3729), (57, 3741), (58, 3765), (59, 3771), (66, 3876), (73, 3963), (74, 3972), (77, 4002), (79, 4020), (84, 4065), (86, 4074), (87, 4089), (89, 4110), (90, 4122), (92, 4206),

Gene: Tiamoceli\_5 Start: 3264, Stop: 3893, Start Num: 43

Candidate Starts for Tiamoceli\_5:

(5, 2697), (Start: 14 @2847 has 41 MA's), (21, 2997), (22, 3009), (23, 3045), (27, 3111), (36, 3177), (Start: 43 @3264 has 3 MA's), (Start: 44 @3267 has 4 MA's), (47, 3327), (51, 3378), (60, 3510), (67, 3588), (68, 3597), (76, 3672), (79, 3702), (82, 3726), (83, 3747), (91, 3843),

Gene: Twonlo\_4 Start: 2419, Stop: 3042, Start Num: 44

Candidate Starts for Twonlo\_4:

(Start: 43 @2416 has 3 MA's), (Start: 44 @2419 has 4 MA's), (47, 2479), (51, 2530), (60, 2662), (62, 2683), (63, 2692), (68, 2743), (76, 2818), (79, 2848), (81, 2857), (82, 2872), (85, 2902), (91, 2989),

Gene: Tycho\_6 Start: 3012, Stop: 4043, Start Num: 14

Candidate Starts for Tycho\_6:

(Start: 14 @3012 has 41 MA's), (19, 3117), (20, 3138), (30, 3264), (41, 3378), (51, 3522), (55, 3561), (56, 3603), (57, 3615), (61, 3681), (64, 3699), (70, 3747), (73, 3780), (77, 3828), (78, 3834), (86, 3900), (87, 3915), (88, 3927), (89, 3936), (90, 3948), (92, 4032),

Gene: YorkOnyx\_6 Start: 2970, Stop: 4001, Start Num: 14

Candidate Starts for YorkOnyx\_6:

(Start: 14 @2970 has 41 MA's), (19, 3075), (20, 3096), (30, 3222), (41, 3336), (51, 3480), (55, 3519), (56, 3561), (57, 3573), (61, 3639), (64, 3657), (70, 3705), (73, 3738), (77, 3786), (78, 3792), (86, 3858), (87, 3873), (88, 3885), (89, 3894), (90, 3906), (92, 3990),