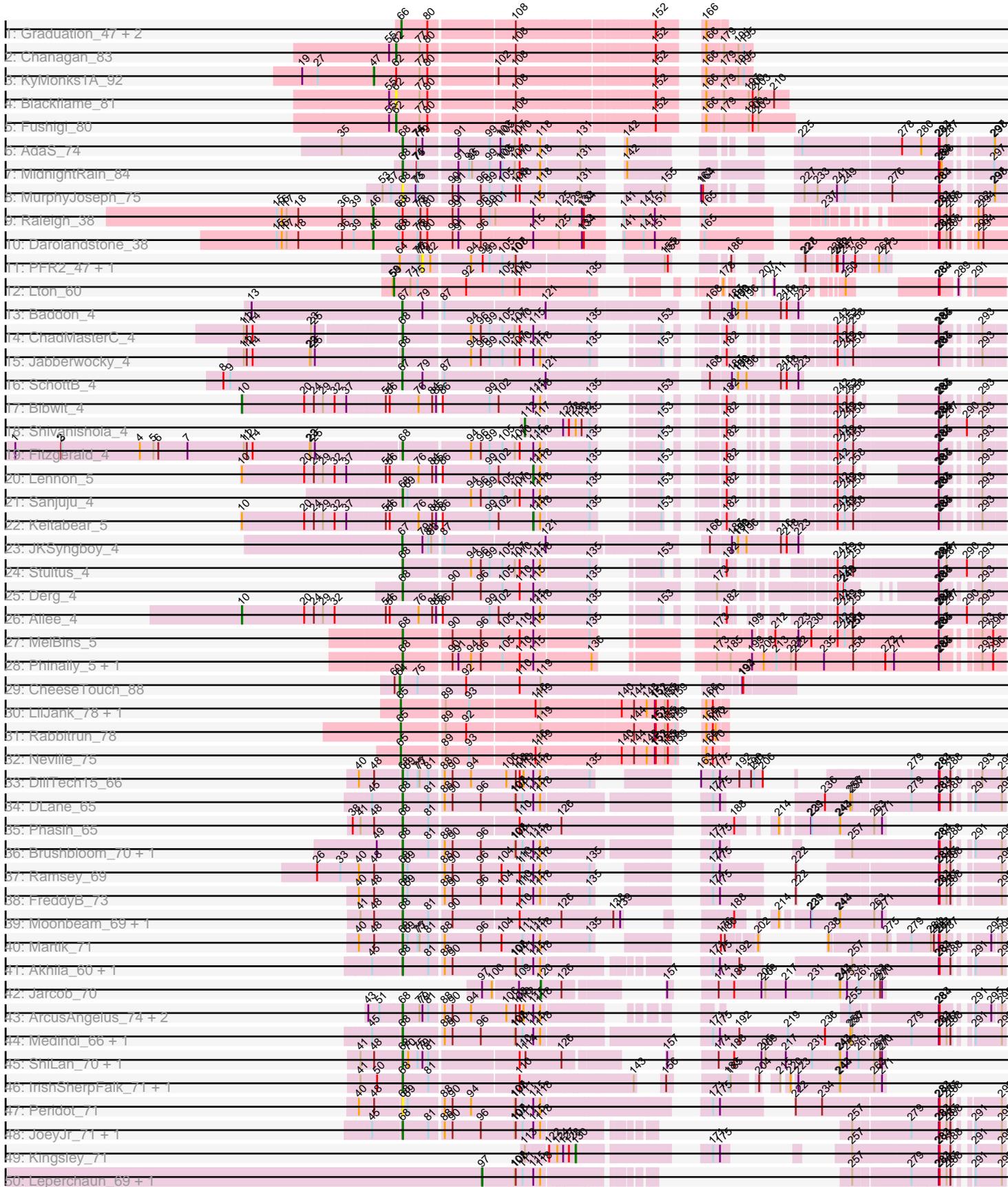
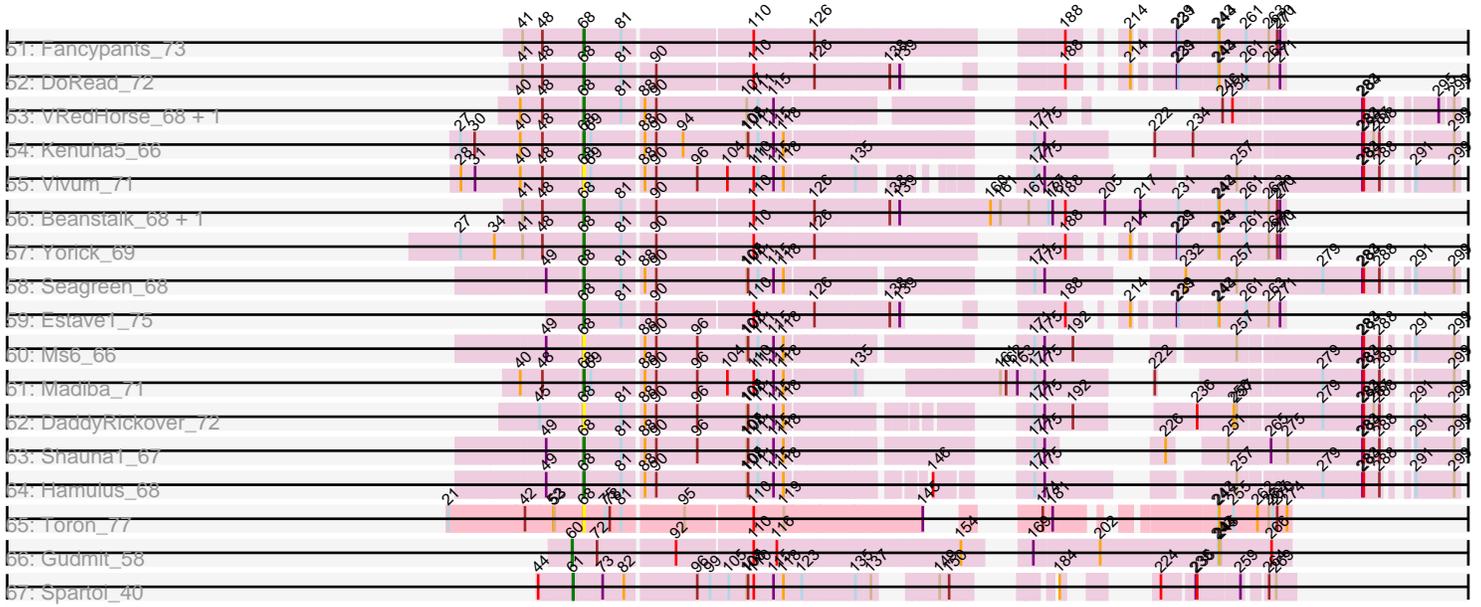


Pham 283716



Pham 283716



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 283716 Report

This analysis was run 02/23/26 on database version 636.

Pham number 283716 has 84 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Graduation\_47, Papez\_46, Magnar\_43
- Track 2 : Chanagan\_83
- Track 3 : KyMonks1A\_92
- Track 4 : Blackflame\_81
- Track 5 : Fushigi\_80
- Track 6 : AdaS\_74
- Track 7 : MidnightRain\_84
- Track 8 : MurphyJoseph\_75
- Track 9 : Raleigh\_38
- Track 10 : Darolandstone\_38
- Track 11 : PFR2\_47, PFR1\_45
- Track 12 : Lton\_60
- Track 13 : Baddon\_4
- Track 14 : ChadMasterC\_4
- Track 15 : Jabberwocky\_4
- Track 16 : SchottB\_4
- Track 17 : Bibwit\_4
- Track 18 : Shivanishola\_4
- Track 19 : Fitzgerald\_4
- Track 20 : Lennon\_5
- Track 21 : Sanjuju\_4
- Track 22 : Keitabear\_5
- Track 23 : JKSyngboy\_4
- Track 24 : Stultus\_4
- Track 25 : Derg\_4
- Track 26 : Ailee\_4
- Track 27 : MelBins\_5
- Track 28 : Phinally\_5, Leonard\_5
- Track 29 : CheeseTouch\_88
- Track 30 : LilJank\_78, Trax\_78
- Track 31 : Rabbitrun\_78
- Track 32 : Neville\_75
- Track 33 : DillTech15\_66
- Track 34 : DLane\_65
- Track 35 : Phasih\_65
- Track 36 : Brushbloom\_70, Batiatus\_66
- Track 37 : Ramsey\_69

- Track 38 : FreddyB\_73
- Track 39 : Moonbeam\_69, Starcevich\_69
- Track 40 : Martik\_71
- Track 41 : Akhila\_60, MilanaBonita\_59
- Track 42 : Jarcob\_70
- Track 43 : ArcusAngelus\_74, Chevrolet\_76, Tweety\_72
- Track 44 : Medindi\_66, Filuzino\_68
- Track 45 : ShiLan\_70, Rita\_76
- Track 46 : IrishSherpFalk\_71, WillSterrel\_71
- Track 47 : Peridot\_71
- Track 48 : JoeyJr\_71, RitaG\_71
- Track 49 : Kingsley\_71
- Track 50 : Leperchaun\_69, Polka14\_75
- Track 51 : Fancypants\_73
- Track 52 : DoRead\_72
- Track 53 : VRedHorse\_68, Cornucopia\_70
- Track 54 : Kenuha5\_66
- Track 55 : Vivum\_71
- Track 56 : Beanstalk\_68, Wachhund\_69
- Track 57 : Yorick\_69
- Track 58 : Seagreen\_68
- Track 59 : Estave1\_75
- Track 60 : Ms6\_66
- Track 61 : Madiba\_71
- Track 62 : DaddyRickover\_72
- Track 63 : Shauna1\_67
- Track 64 : Hamulus\_68
- Track 65 : Toron\_77
- Track 66 : Gudmit\_58
- Track 67 : Spartoi\_40

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

The start number called the most often in the published annotations is 68, it was called in 45 of the 72 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AdaS\_74, Akhila\_60, ArcusAngelus\_74, Batiatus\_66, Beanstalk\_68, Brushbloom\_70, ChadMasterC\_4, Chevrolet\_76, Cornucopia\_70, DLane\_65, DaddyRickover\_72, Derg\_4, DillTech15\_66, DoRead\_72, Estave1\_75, Fancypants\_73, Filuzino\_68, Fitzgerald\_4, FreddyB\_73, Hamulus\_68, IrishSherpFalk\_71, Jabberwocky\_4, JoeyJr\_71, Kenuha5\_66, Leonard\_5, Madiba\_71, Martik\_71, Medindi\_66, MelBins\_5, MidnightRain\_84, MilanaBonita\_59, Moonbeam\_69, Ms6\_66, MurphyJoseph\_75, Peridot\_71, Phasih\_65, Phinally\_5, Ramsey\_69, RitaG\_71, Rita\_76, Sanjuju\_4, Seagreen\_68, Shauna1\_67, ShiLan\_70, Starcevich\_69, Stultus\_4, Toron\_77, Tweety\_72, VRedHorse\_68, Vivum\_71, Wachhund\_69, WillSterrel\_71, Yorick\_69,

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

- Darolandstone\_38, Raleigh\_38,

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

- Ailee\_4, Baddon\_4, Bibwit\_4, Blackflame\_81, Chanagan\_83, CheeseTouch\_88, Fushigi\_80, Graduation\_47, Gudmit\_58, JKSyngboy\_4, Jarcob\_70, Keitabear\_5, Kingsley\_71, KyMonks1A\_92, Lennon\_5, Leperchaun\_69, LilJank\_78, Lton\_60, Magnar\_43, Neville\_75, PFR1\_45, PFR2\_47, Papez\_46, Polka14\_75, Rabbitrun\_78, SchottB\_4, Shivanishola\_4, Spartoi\_40, Trax\_78,

### Summary by start number:

Start 10:

- Found in 4 of 84 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Ailee\_4 (DE1), Bibwit\_4 (DE1),

Start 46:

- Found in 2 of 84 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Darolandstone\_38 (BC2), Raleigh\_38 (BC2),

Start 47:

- Found in 1 of 84 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: KyMonks1A\_92 (A1),

Start 59:

- Found in 1 of 84 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lton\_60 (CZ),

Start 60:

- Found in 2 of 84 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Gudmit\_58 (singleton),

Start 61:

- Found in 1 of 84 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Spartoi\_40 (singleton),

Start 62:

- Found in 4 of 84 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Blackflame\_81 (A1), Chanagan\_83 (A1), Fushigi\_80 (A1),

Start 64:

- Found in 3 of 84 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 33.3% of time when present
- Phage (with cluster) where this start called: CheeseTouch\_88 (DN1),

Start 65:

- Found in 4 of 84 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 3 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilJank\_78 (DU2), Neville\_75 (DU2), Rabbitrun\_78 (DU2), Trax\_78 (DU2),

Start 66:

- Found in 3 of 84 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 3 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Graduation\_47 (A1), Magnar\_43 (A1), Papez\_46 (A1),

Start 67:

- Found in 3 of 84 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 3 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Baddon\_4 (DE1), JKSyngboy\_4 (DE1), SchottB\_4 (DE1),

Start 68:

- Found in 55 of 84 ( 65.5% ) of genes in pham
- Manual Annotations of this start: 45 of 72
- Called 96.4% of time when present
- Phage (with cluster) where this start called: AdaS\_74 (AY), Akhila\_60 (F1), ArcusAngelus\_74 (F1), Batiatus\_66 (F1), Beanstalk\_68 (F1), Brushbloom\_70 (F1), ChadMasterC\_4 (DE1), Chevrolet\_76 (F1), Cornucopia\_70 (F1), DLane\_65 (F1), DaddyRickover\_72 (F1), Derg\_4 (DE1), DillTech15\_66 (F1), DoRead\_72 (F1), Estave1\_75 (F1), Fancypants\_73 (F1), Filuzino\_68 (F1), Fitzgerald\_4 (DE1), FreddyB\_73 (F1), Hamulus\_68 (F1), IrishSherpFalk\_71 (F1), Jabberwocky\_4 (DE1), JoeyJr\_71 (F1), Kenuha5\_66 (F1), Leonard\_5 (DE2), Madiba\_71 (F1), Martik\_71 (F1), Medindi\_66 (F1), MelBins\_5 (DE2), MidnightRain\_84 (AY), MilanaBonita\_59 (F1), Moonbeam\_69 (F1), Ms6\_66 (F1), MurphyJoseph\_75 (AY), Peridot\_71 (F1), Phasih\_65 (F1), Phinally\_5 (DE2), Ramsey\_69 (F1), RitaG\_71 (F1), Rita\_76 (F1), Sanjuju\_4 (DE1), Seagreen\_68 (F1), Shauna1\_67 (F1), ShiLan\_70 (F1), Starcevich\_69 (F1), Stultus\_4 (DE1), Toron\_77 (F6), Tweety\_72 (F1), VRedHorse\_68 (F1), Vivum\_71 (F1), Wachhund\_69 (F1), WillSterrel\_71 (F1), Yorick\_69 (F1),

Start 79:

- Found in 11 of 84 ( 13.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 18.2% of time when present
- Phage (with cluster) where this start called: PFR1\_45 (BX), PFR2\_47 (BX),

Start 97:

- Found in 3 of 84 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Leperchaun\_69 (F1), Polka14\_75 (F1),

Start 113:

- Found in 2 of 84 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Shivanishola\_4 (DE1),

Start 115:

- Found in 45 of 84 ( 53.6% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 4.4% of time when present
- Phage (with cluster) where this start called: Keitabear\_5 (DE1), Lennon\_5 (DE1),

Start 120:

- Found in 1 of 84 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jarcob\_70 (F1),

Start 130:

- Found in 2 of 84 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 72
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Kingsley\_71 (F1),

### **Summary by clusters:**

There are 12 clusters represented in this pham: F1, singleton, F6, DE1, DE2, A1, CZ, DN1, AY, DU2, BX, BC2,

Info for manual annotations of cluster A1:

- Start number 47 was manually annotated 1 time for cluster A1.
- Start number 62 was manually annotated 2 times for cluster A1.
- Start number 66 was manually annotated 3 times for cluster A1.

Info for manual annotations of cluster AY:

- Start number 68 was manually annotated 2 times for cluster AY.

Info for manual annotations of cluster BC2:

- Start number 46 was manually annotated 2 times for cluster BC2.

Info for manual annotations of cluster CZ:

- Start number 59 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster DE1:

- Start number 10 was manually annotated 2 times for cluster DE1.
- Start number 67 was manually annotated 3 times for cluster DE1.
- Start number 68 was manually annotated 6 times for cluster DE1.

- Start number 113 was manually annotated 1 time for cluster DE1.
- Start number 115 was manually annotated 2 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 68 was manually annotated 3 times for cluster DE2.

Info for manual annotations of cluster DN1:

- Start number 64 was manually annotated 1 time for cluster DN1.

Info for manual annotations of cluster DU2:

- Start number 65 was manually annotated 3 times for cluster DU2.

Info for manual annotations of cluster F1:

- Start number 68 was manually annotated 34 times for cluster F1.
- Start number 97 was manually annotated 2 times for cluster F1.
- Start number 120 was manually annotated 1 time for cluster F1.
- Start number 130 was manually annotated 1 time for cluster F1.

### **Gene Information:**

Gene: AdaS\_74 Start: 41281, Stop: 42669, Start Num: 68

Candidate Starts for AdaS\_74:

(35, 41101), (Start: 68 @41281 has 45 MA's), (74, 41320), (75, 41323), (79, 41338), (91, 41434), (99, 41530), (103, 41560), (105, 41566), (107, 41602), (110, 41617), (118, 41674), (131, 41785), (142, 41863), (225, 42127), (278, 42412), (280, 42457), (283, 42511), (284, 42514), (287, 42535), (297, 42631), (298, 42634),

Gene: Ailee\_4 Start: 2435, Stop: 4309, Start Num: 10

Candidate Starts for Ailee\_4:

(Start: 10 @2435 has 2 MA's), (20, 2627), (24, 2657), (29, 2684), (32, 2720), (54, 2873), (56, 2885), (76, 2972), (84, 3014), (85, 3026), (86, 3032), (99, 3176), (102, 3200), (Start: 115 @3296 has 2 MA's), (118, 3317), (135, 3452), (153, 3557), (182, 3653), (242, 3821), (249, 3842), (258, 3863), (283, 4112), (284, 4115), (285, 4118), (287, 4136), (290, 4199), (293, 4247),

Gene: Akhila\_60 Start: 39092, Stop: 40543, Start Num: 68

Candidate Starts for Akhila\_60:

(45, 39011), (Start: 68 @39092 has 45 MA's), (81, 39167), (88, 39203), (90, 39227), (107, 39413), (108, 39416), (111, 39437), (Start: 115 @39464 has 2 MA's), (118, 39485), (171, 39830), (175, 39851), (192, 39911), (257, 40151), (283, 40391), (284, 40394), (288, 40424), (291, 40451), (299, 40532),

Gene: ArcusAngelus\_74 Start: 44743, Stop: 45855, Start Num: 68

Candidate Starts for ArcusAngelus\_74:

(43, 44644), (51, 44677), (Start: 68 @44743 has 45 MA's), (77, 44791), (79, 44800), (81, 44818), (88, 44854), (90, 44878), (94, 44935), (106, 45040), (108, 45067), (110, 45079), (112, 45091), (Start: 115 @45115 has 2 MA's), (118, 45136), (255, 45472), (283, 45712), (284, 45715), (291, 45772), (295, 45820), (299, 45844),

Gene: Baddon\_4 Start: 2579, Stop: 3649, Start Num: 67

Candidate Starts for Baddon\_4:

(13, 2123), (Start: 67 @2579 has 3 MA's), (79, 2636), (87, 2690), (121, 2984), (168, 3377), (187, 3437), (189, 3452), (190, 3455), (196, 3476), (216, 3581), (218, 3599), (223, 3635),

Gene: Batiatus\_66 Start: 42780, Stop: 44096, Start Num: 68

Candidate Starts for Batiatus\_66:

(49, 42714), (Start: 68 @42780 has 45 MA's), (81, 42855), (88, 42891), (90, 42915), (96, 43002), (107, 43101), (108, 43104), (111, 43125), (Start: 115 @43152 has 2 MA's), (118, 43173), (171, 43572), (175, 43593), (257, 43695), (283, 43944), (284, 43947), (288, 43977), (291, 44004), (299, 44085),

Gene: Beanstalk\_68 Start: 43692, Stop: 45113, Start Num: 68

Candidate Starts for Beanstalk\_68:

(41, 43569), (48, 43611), (Start: 68 @43692 has 45 MA's), (81, 43767), (90, 43827), (110, 44022), (126, 44145), (138, 44289), (139, 44310), (160, 44499), (161, 44520), (167, 44580), (177, 44616), (181, 44625), (188, 44652), (205, 44736), (217, 44811), (231, 44892), (243, 44970), (244, 44973), (261, 45030), (263, 45078), (270, 45096), (271, 45102),

Gene: Bibwit\_4 Start: 2433, Stop: 4142, Start Num: 10

Candidate Starts for Bibwit\_4:

(Start: 10 @2433 has 2 MA's), (20, 2625), (24, 2655), (29, 2682), (32, 2718), (37, 2754), (54, 2871), (56, 2883), (76, 2970), (84, 3012), (85, 3024), (86, 3030), (99, 3174), (102, 3198), (Start: 115 @3294 has 2 MA's), (118, 3315), (135, 3450), (153, 3555), (182, 3651), (242, 3819), (252, 3846), (258, 3861), (283, 3996), (284, 3999), (285, 4002), (293, 4080),

Gene: Blackflame\_81 Start: 49915, Stop: 48884, Start Num: 62

Candidate Starts for Blackflame\_81:

(55, 49936), (Start: 62 @49915 has 2 MA's), (77, 49849), (80, 49825), (108, 49579), (152, 49195), (166, 49120), (179, 49075), (197, 49006), (200, 48994), (203, 48976), (210, 48928),

Gene: Brushbloom\_70 Start: 43712, Stop: 45028, Start Num: 68

Candidate Starts for Brushbloom\_70:

(49, 43646), (Start: 68 @43712 has 45 MA's), (81, 43787), (88, 43823), (90, 43847), (96, 43934), (107, 44033), (108, 44036), (111, 44057), (Start: 115 @44084 has 2 MA's), (118, 44105), (171, 44504), (175, 44525), (257, 44627), (283, 44876), (284, 44879), (288, 44909), (291, 44936), (299, 45017),

Gene: ChadMasterC\_4 Start: 2379, Stop: 3599, Start Num: 68

Candidate Starts for ChadMasterC\_4:

(11, 1923), (12, 1932), (14, 1950), (23, 2130), (25, 2142), (Start: 68 @2379 has 45 MA's), (94, 2571), (96, 2601), (99, 2628), (105, 2664), (107, 2700), (110, 2715), (Start: 115 @2751 has 2 MA's), (135, 2907), (153, 3012), (182, 3108), (242, 3276), (252, 3303), (258, 3318), (283, 3453), (284, 3456), (285, 3459), (293, 3537),

Gene: Chanagan\_83 Start: 48048, Stop: 47131, Start Num: 62

Candidate Starts for Chanagan\_83:

(55, 48069), (Start: 62 @48048 has 2 MA's), (77, 47982), (80, 47958), (108, 47712), (152, 47328), (166, 47253), (179, 47208), (191, 47169), (195, 47157),

Gene: CheeseTouch\_88 Start: 43473, Stop: 44507, Start Num: 64

Candidate Starts for CheeseTouch\_88:

(Start: 60 @43464 has 1 MA's), (Start: 64 @43473 has 1 MA's), (75, 43515), (92, 43650), (110, 43803), (119, 43863), (193, 44355), (194, 44358),

Gene: Chevrolet\_76 Start: 44744, Stop: 45856, Start Num: 68

Candidate Starts for Chevrolet\_76:

(43, 44645), (51, 44678), (Start: 68 @44744 has 45 MA's), (77, 44792), (79, 44801), (81, 44819), (88, 44855), (90, 44879), (94, 44936), (106, 45041), (108, 45068), (110, 45080), (112, 45092), (Start: 115 @45116 has 2 MA's), (118, 45137), (255, 45473), (283, 45713), (284, 45716), (291, 45773), (295, 45821), (299, 45845),

Gene: Cornucopia\_70 Start: 43350, Stop: 44651, Start Num: 68

Candidate Starts for Cornucopia\_70:

(40, 43227), (48, 43269), (Start: 68 @43350 has 45 MA's), (81, 43425), (88, 43461), (90, 43485), (107, 43671), (111, 43695), (Start: 115 @43722 has 2 MA's), (246, 44238), (254, 44259), (283, 44508), (284, 44511), (295, 44616), (299, 44640),

Gene: DLane\_65 Start: 42636, Stop: 44030, Start Num: 68

Candidate Starts for DLane\_65:

(45, 42555), (Start: 68 @42636 has 45 MA's), (81, 42711), (88, 42747), (90, 42771), (96, 42858), (107, 42957), (108, 42960), (111, 42981), (Start: 115 @43008 has 2 MA's), (118, 43029), (171, 43428), (175, 43449), (236, 43554), (256, 43632), (257, 43638), (279, 43800), (283, 43878), (284, 43881), (288, 43911), (291, 43938), (299, 44019),

Gene: DaddyRickover\_72 Start: 45172, Stop: 46629, Start Num: 68

Candidate Starts for DaddyRickover\_72:

(45, 45091), (Start: 68 @45172 has 45 MA's), (81, 45247), (88, 45283), (90, 45307), (96, 45394), (107, 45493), (108, 45496), (111, 45517), (Start: 115 @45544 has 2 MA's), (118, 45565), (171, 45910), (175, 45931), (192, 45991), (236, 46153), (256, 46231), (257, 46237), (279, 46399), (283, 46477), (284, 46480), (287, 46501), (288, 46510), (291, 46537), (299, 46618),

Gene: Darolandstone\_38 Start: 28753, Stop: 30447, Start Num: 46

Candidate Starts for Darolandstone\_38:

(15, 28456), (16, 28471), (17, 28486), (18, 28522), (36, 28657), (39, 28693), (Start: 46 @28753 has 2 MA's), (63, 28831), (Start: 68 @28843 has 45 MA's), (75, 28885), (78, 28894), (80, 28915), (90, 28993), (91, 29011), (96, 29080), (Start: 115 @29233 has 2 MA's), (125, 29308), (133, 29377), (134, 29383), (141, 29452), (147, 29512), (151, 29545), (165, 29635), (283, 30283), (284, 30286), (287, 30307), (288, 30316), (292, 30352), (294, 30367),

Gene: Derg\_4 Start: 2405, Stop: 3790, Start Num: 68

Candidate Starts for Derg\_4:

(Start: 68 @2405 has 45 MA's), (90, 2540), (96, 2627), (105, 2690), (110, 2741), (Start: 115 @2777 has 2 MA's), (135, 2933), (173, 3158), (242, 3425), (248, 3443), (249, 3446), (283, 3617), (284, 3620), (285, 3623), (293, 3701),

Gene: DillTech15\_66 Start: 41528, Stop: 42871, Start Num: 68

Candidate Starts for DillTech15\_66:

(40, 41405), (48, 41447), (Start: 68 @41528 has 45 MA's), (69, 41543), (75, 41570), (77, 41576), (81, 41603), (88, 41639), (90, 41663), (94, 41720), (106, 41825), (108, 41852), (110, 41864), (112, 41876), (Start: 115 @41900 has 2 MA's), (118, 41921), (135, 42056), (163, 42206), (171, 42242), (175, 42263), (192, 42323), (198, 42359), (201, 42368), (206, 42395), (279, 42638), (283, 42719), (284, 42722), (288, 42752), (293, 42800), (299, 42860),

Gene: DoRead\_72 Start: 43076, Stop: 44179, Start Num: 68

Candidate Starts for DoRead\_72:

(41, 42953), (48, 42995), (Start: 68 @43076 has 45 MA's), (81, 43151), (90, 43211), (110, 43406), (126, 43529), (138, 43673), (139, 43694), (188, 43823), (214, 43889), (229, 43955), (231, 43958), (243, 44036), (244, 44039), (261, 44096), (263, 44144), (271, 44168),

Gene: Estave1\_75 Start: 47847, Stop: 48950, Start Num: 68

Candidate Starts for Estave1\_75:

(Start: 68 @47847 has 45 MA's), (81, 47922), (90, 47982), (110, 48177), (126, 48300), (138, 48444), (139, 48465), (188, 48594), (214, 48660), (229, 48726), (231, 48729), (243, 48807), (244, 48810), (261, 48867), (263, 48915), (271, 48939),

Gene: Fancypants\_73 Start: 46022, Stop: 47248, Start Num: 68

Candidate Starts for Fancypants\_73:

(41, 45899), (48, 45941), (Start: 68 @46022 has 45 MA's), (81, 46097), (110, 46352), (126, 46475), (188, 46892), (214, 46958), (229, 47024), (231, 47027), (243, 47105), (244, 47108), (261, 47165), (263, 47213), (270, 47231), (271, 47237),

Gene: Filuzino\_68 Start: 42971, Stop: 44581, Start Num: 68

Candidate Starts for Filuzino\_68:

(45, 42890), (Start: 68 @42971 has 45 MA's), (88, 43082), (90, 43106), (96, 43193), (107, 43292), (108, 43295), (111, 43316), (Start: 115 @43343 has 2 MA's), (118, 43364), (171, 43763), (175, 43784), (192, 43844), (219, 43994), (236, 44105), (256, 44183), (257, 44189), (279, 44351), (283, 44429), (284, 44432), (287, 44453), (288, 44462), (291, 44489), (299, 44570),

Gene: Fitzgerald\_4 Start: 2397, Stop: 3731, Start Num: 68

Candidate Starts for Fitzgerald\_4:

(1, 1218), (2, 1359), (3, 1362), (4, 1602), (5, 1644), (6, 1659), (7, 1749), (11, 1923), (12, 1932), (14, 1950), (22, 2127), (23, 2130), (25, 2142), (Start: 68 @2397 has 45 MA's), (94, 2589), (96, 2619), (99, 2646), (105, 2682), (107, 2718), (110, 2733), (Start: 115 @2769 has 2 MA's), (118, 2790), (135, 2925), (153, 3030), (182, 3126), (242, 3294), (249, 3315), (258, 3336), (283, 3585), (284, 3588), (285, 3591), (293, 3669),

Gene: FreddyB\_73 Start: 44628, Stop: 45971, Start Num: 68

Candidate Starts for FreddyB\_73:

(40, 44505), (48, 44547), (Start: 68 @44628 has 45 MA's), (69, 44643), (88, 44739), (90, 44763), (96, 44850), (104, 44910), (110, 44964), (111, 44973), (Start: 115 @45000 has 2 MA's), (118, 45021), (135, 45156), (171, 45342), (175, 45363), (222, 45498), (283, 45819), (284, 45822), (287, 45843), (288, 45852), (299, 45960),

Gene: Fushigi\_80 Start: 47333, Stop: 46284, Start Num: 62

Candidate Starts for Fushigi\_80:

(55, 47354), (Start: 62 @47333 has 2 MA's), (77, 47267), (80, 47243), (108, 46997), (152, 46613), (166, 46538), (179, 46493), (197, 46424), (200, 46412), (203, 46394),

Gene: Graduation\_47 Start: 34493, Stop: 33666, Start Num: 66

Candidate Starts for Graduation\_47:

(Start: 66 @34493 has 3 MA's), (80, 34421), (108, 34175), (152, 33791), (166, 33716),

Gene: Gudmit\_58 Start: 34535, Stop: 35920, Start Num: 60

Candidate Starts for Gudmit\_58:

(Start: 60 @34535 has 1 MA's), (72, 34586), (92, 34739), (110, 34892), (116, 34937), (154, 35306), (169, 35381), (202, 35516), (243, 35765), (244, 35768), (245, 35771), (266, 35879),

Gene: Hamulus\_68 Start: 43189, Stop: 44649, Start Num: 68

Candidate Starts for Hamulus\_68:

(49, 43123), (Start: 68 @43189 has 45 MA's), (81, 43264), (88, 43300), (90, 43324), (107, 43510), (108, 43513), (111, 43534), (Start: 115 @43561 has 2 MA's), (118, 43582), (146, 43828), (171, 43936), (175, 43957), (257, 44257), (279, 44419), (283, 44497), (284, 44500), (288, 44530), (291, 44557),

(299, 44638),

Gene: IrishSherpFalk\_71 Start: 45147, Stop: 46322, Start Num: 68

Candidate Starts for IrishSherpFalk\_71:

(41, 45024), (50, 45072), (Start: 68 @45147 has 45 MA's), (81, 45222), (110, 45477), (143, 45804), (156, 45828), (183, 45924), (185, 45930), (204, 45993), (215, 46026), (220, 46041), (223, 46053), (243, 46179), (244, 46182), (263, 46287), (271, 46311),

Gene: JKSyngboy\_4 Start: 2579, Stop: 3643, Start Num: 67

Candidate Starts for JKSyngboy\_4:

(Start: 67 @2579 has 3 MA's), (79, 2636), (81, 2654), (83, 2663), (87, 2690), (121, 2984), (168, 3371), (187, 3431), (189, 3446), (190, 3449), (196, 3470), (216, 3575), (218, 3593), (223, 3629),

Gene: Jabberwocky\_4 Start: 2397, Stop: 3731, Start Num: 68

Candidate Starts for Jabberwocky\_4:

(11, 1923), (12, 1932), (14, 1950), (22, 2127), (23, 2130), (25, 2142), (Start: 68 @2397 has 45 MA's), (94, 2589), (96, 2619), (99, 2646), (105, 2682), (107, 2718), (110, 2733), (Start: 115 @2769 has 2 MA's), (118, 2790), (135, 2925), (153, 3030), (182, 3126), (242, 3294), (249, 3315), (258, 3336), (283, 3585), (284, 3588), (285, 3591), (293, 3669),

Gene: Jarcob\_70 Start: 45803, Stop: 46582, Start Num: 120

Candidate Starts for Jarcob\_70:

(Start: 97 @45638 has 2 MA's), (100, 45668), (109, 45740), (Start: 120 @45803 has 1 MA's), (126, 45866), (157, 46013), (174, 46082), (188, 46124), (205, 46208), (209, 46217), (217, 46280), (231, 46361), (243, 46439), (244, 46442), (253, 46463), (261, 46499), (263, 46547), (270, 46565), (271, 46571),

Gene: JoeyJr\_71 Start: 45459, Stop: 46547, Start Num: 68

Candidate Starts for JoeyJr\_71:

(45, 45378), (Start: 68 @45459 has 45 MA's), (81, 45534), (88, 45570), (90, 45594), (96, 45681), (107, 45780), (108, 45783), (111, 45804), (Start: 115 @45831 has 2 MA's), (118, 45852), (257, 46155), (279, 46317), (283, 46395), (284, 46398), (287, 46419), (288, 46428), (291, 46455), (299, 46536),

Gene: Keitabear\_5 Start: 4089, Stop: 5051, Start Num: 115

Candidate Starts for Keitabear\_5:

(Start: 10 @3228 has 2 MA's), (20, 3420), (24, 3450), (29, 3477), (32, 3513), (37, 3549), (54, 3666), (56, 3678), (76, 3765), (84, 3807), (85, 3819), (86, 3825), (99, 3969), (102, 3993), (Start: 115 @4089 has 2 MA's), (118, 4110), (135, 4245), (153, 4350), (182, 4446), (242, 4614), (249, 4635), (258, 4656), (283, 4905), (284, 4908), (285, 4911), (293, 4989),

Gene: Kenuha5\_66 Start: 44310, Stop: 45839, Start Num: 68

Candidate Starts for Kenuha5\_66:

(27, 44061), (30, 44091), (40, 44187), (48, 44229), (Start: 68 @44310 has 45 MA's), (69, 44325), (88, 44421), (90, 44445), (94, 44502), (107, 44631), (108, 44634), (111, 44655), (Start: 115 @44682 has 2 MA's), (118, 44703), (171, 45117), (175, 45138), (222, 45273), (234, 45354), (283, 45687), (284, 45690), (287, 45711), (288, 45720), (299, 45828),

Gene: Kingsley\_71 Start: 46661, Stop: 47491, Start Num: 130

Candidate Starts for Kingsley\_71:

(Start: 113 @46526 has 1 MA's), (122, 46583), (124, 46607), (127, 46625), (128, 46640), (Start: 130 @46661 has 1 MA's), (171, 46967), (175, 46988), (257, 47090), (283, 47339), (284, 47342), (288, 47372), (291, 47399), (299, 47480),

Gene: KyMonks1A\_92 Start: 50898, Stop: 49912, Start Num: 47

Candidate Starts for KyMonks1A\_92:

(19, 51117), (27, 51069), (Start: 47 @50898 has 1 MA's), (Start: 62 @50829 has 2 MA's), (77, 50763), (80, 50739), (102, 50544), (108, 50493), (152, 50109), (166, 50034), (179, 49989), (191, 49950), (195, 49938),

Gene: Lennon\_5 Start: 3295, Stop: 4143, Start Num: 115

Candidate Starts for Lennon\_5:

(Start: 10 @2434 has 2 MA's), (20, 2626), (24, 2656), (29, 2683), (32, 2719), (37, 2755), (54, 2872), (56, 2884), (76, 2971), (84, 3013), (85, 3025), (86, 3031), (99, 3175), (102, 3199), (Start: 115 @3295 has 2 MA's), (118, 3316), (135, 3451), (153, 3556), (182, 3652), (242, 3820), (258, 3862), (283, 3997), (284, 4000), (285, 4003), (293, 4081),

Gene: Leonard\_5 Start: 2785, Stop: 4344, Start Num: 68

Candidate Starts for Leonard\_5:

(Start: 68 @2785 has 45 MA's), (90, 2920), (91, 2938), (94, 2977), (96, 3007), (105, 3070), (110, 3121), (Start: 115 @3157 has 2 MA's), (136, 3319), (173, 3538), (185, 3580), (199, 3643), (208, 3679), (213, 3715), (221, 3760), (222, 3775), (235, 3862), (258, 3952), (272, 4039), (277, 4066), (283, 4198), (284, 4201), (285, 4204), (293, 4282), (296, 4312),

Gene: Leperchaun\_69 Start: 44915, Stop: 45781, Start Num: 97

Candidate Starts for Leperchaun\_69:

(Start: 97 @44915 has 2 MA's), (107, 45014), (108, 45017), (111, 45038), (Start: 115 @45065 has 2 MA's), (118, 45086), (257, 45389), (279, 45551), (283, 45629), (284, 45632), (287, 45653), (288, 45662), (291, 45689), (299, 45770),

Gene: LilJank\_78 Start: 48712, Stop: 49575, Start Num: 65

Candidate Starts for LilJank\_78:

(Start: 65 @48712 has 3 MA's), (89, 48826), (93, 48898), (116, 49087), (119, 49102), (140, 49342), (144, 49378), (148, 49417), (151, 49438), (152, 49441), (155, 49462), (158, 49471), (159, 49495), (166, 49516), (170, 49534),

Gene: Lton\_60 Start: 35512, Stop: 36642, Start Num: 59

Candidate Starts for Lton\_60:

(58, 35509), (Start: 59 @35512 has 1 MA's), (71, 35560), (75, 35578), (92, 35713), (105, 35821), (107, 35857), (110, 35872), (135, 36064), (178, 36241), (207, 36268), (211, 36274), (250, 36346), (283, 36490), (284, 36493), (289, 36532), (291, 36550),

Gene: Madiba\_71 Start: 44963, Stop: 46402, Start Num: 68

Candidate Starts for Madiba\_71:

(40, 44840), (48, 44882), (Start: 68 @44963 has 45 MA's), (69, 44978), (88, 45074), (90, 45098), (96, 45185), (104, 45245), (110, 45299), (111, 45308), (Start: 115 @45335 has 2 MA's), (118, 45356), (135, 45491), (161, 45698), (162, 45710), (163, 45734), (171, 45770), (175, 45791), (222, 45926), (279, 46169), (283, 46250), (284, 46253), (288, 46283), (299, 46391),

Gene: Magnar\_43 Start: 33305, Stop: 32478, Start Num: 66

Candidate Starts for Magnar\_43:

(Start: 66 @33305 has 3 MA's), (80, 33233), (108, 32987), (152, 32603), (166, 32528),

Gene: Martik\_71 Start: 45731, Stop: 46957, Start Num: 68

Candidate Starts for Martik\_71:

(40, 45608), (48, 45650), (Start: 68 @45731 has 45 MA's), (69, 45746), (75, 45773), (77, 45779), (81, 45806), (88, 45842), (96, 45953), (104, 46013), (111, 46076), (Start: 115 @46103 has 2 MA's), (118,

46124), (135, 46259), (176, 46466), (180, 46478), (202, 46553), (238, 46562), (275, 46682), (279, 46736), (281, 46790), (282, 46799), (283, 46814), (284, 46817), (287, 46838), (295, 46922), (299, 46946),

Gene: Medindi\_66 Start: 41626, Stop: 43236, Start Num: 68

Candidate Starts for Medindi\_66:

(45, 41545), (Start: 68 @41626 has 45 MA's), (88, 41737), (90, 41761), (96, 41848), (107, 41947), (108, 41950), (111, 41971), (Start: 115 @41998 has 2 MA's), (118, 42019), (171, 42418), (175, 42439), (192, 42499), (219, 42649), (236, 42760), (256, 42838), (257, 42844), (279, 43006), (283, 43084), (284, 43087), (287, 43108), (288, 43117), (291, 43144), (299, 43225),

Gene: MelBins\_5 Start: 2786, Stop: 4273, Start Num: 68

Candidate Starts for MelBins\_5:

(Start: 68 @2786 has 45 MA's), (90, 2921), (96, 3008), (105, 3071), (110, 3122), (Start: 115 @3158 has 2 MA's), (135, 3314), (173, 3539), (199, 3632), (212, 3674), (223, 3737), (230, 3773), (242, 3836), (249, 3857), (257, 3875), (258, 3878), (283, 4127), (284, 4130), (285, 4133), (293, 4211), (296, 4241),

Gene: MidnightRain\_84 Start: 45169, Stop: 46623, Start Num: 68

Candidate Starts for MidnightRain\_84:

(Start: 68 @45169 has 45 MA's), (74, 45208), (75, 45211), (91, 45322), (93, 45355), (95, 45364), (99, 45418), (103, 45448), (105, 45454), (107, 45490), (110, 45505), (118, 45562), (131, 45673), (142, 45751), (283, 46465), (284, 46468), (286, 46474), (297, 46585),

Gene: MilanaBonita\_59 Start: 39092, Stop: 40543, Start Num: 68

Candidate Starts for MilanaBonita\_59:

(45, 39011), (Start: 68 @39092 has 45 MA's), (81, 39167), (88, 39203), (90, 39227), (107, 39413), (108, 39416), (111, 39437), (Start: 115 @39464 has 2 MA's), (118, 39485), (171, 39830), (175, 39851), (192, 39911), (257, 40151), (283, 40391), (284, 40394), (288, 40424), (291, 40451), (299, 40532),

Gene: Moonbeam\_69 Start: 44939, Stop: 46042, Start Num: 68

Candidate Starts for Moonbeam\_69:

(41, 44816), (48, 44858), (Start: 68 @44939 has 45 MA's), (81, 45014), (90, 45074), (110, 45269), (126, 45392), (138, 45536), (139, 45557), (188, 45686), (214, 45752), (229, 45818), (231, 45821), (243, 45899), (244, 45902), (263, 46007), (271, 46031),

Gene: Ms6\_66 Start: 38754, Stop: 40259, Start Num: 68

Candidate Starts for Ms6\_66:

(49, 38688), (Start: 68 @38754 has 45 MA's), (88, 38865), (90, 38889), (96, 38976), (107, 39075), (108, 39078), (111, 39099), (Start: 115 @39126 has 2 MA's), (118, 39147), (171, 39546), (175, 39567), (192, 39627), (257, 39867), (283, 40107), (284, 40110), (288, 40140), (291, 40167), (299, 40248),

Gene: MurphyJoseph\_75 Start: 42444, Stop: 43799, Start Num: 68

Candidate Starts for MurphyJoseph\_75:

(53, 42384), (57, 42408), (Start: 68 @42444 has 45 MA's), (73, 42480), (75, 42486), (90, 42579), (91, 42597), (96, 42666), (99, 42693), (105, 42729), (108, 42768), (110, 42780), (118, 42837), (131, 42948), (155, 43128), (163, 43149), (164, 43155), (227, 43296), (233, 43332), (241, 43383), (249, 43404), (276, 43521), (283, 43641), (284, 43644), (297, 43761), (298, 43764),

Gene: Neville\_75 Start: 47371, Stop: 48234, Start Num: 65

Candidate Starts for Neville\_75:

(Start: 65 @47371 has 3 MA's), (89, 47485), (93, 47557), (116, 47746), (119, 47761), (140, 48001), (144, 48037), (148, 48076), (151, 48097), (152, 48100), (155, 48121), (158, 48130), (159, 48154), (166, 48175), (170, 48193),

Gene: PFR1\_45 Start: 31715, Stop: 32761, Start Num: 79

Candidate Starts for PFR1\_45:

(Start: 64 @31649 has 1 MA's), (75, 31700), (77, 31706), (79, 31715), (82, 31739), (94, 31850), (98, 31886), (99, 31907), (105, 31943), (107, 31979), (108, 31982), (155, 32363), (158, 32372), (186, 32453), (227, 32531), (228, 32534), (239, 32600), (240, 32609), (242, 32612), (247, 32630), (260, 32666), (268, 32723), (273, 32744),

Gene: PFR2\_47 Start: 33284, Stop: 34330, Start Num: 79

Candidate Starts for PFR2\_47:

(Start: 64 @33218 has 1 MA's), (75, 33269), (77, 33275), (79, 33284), (82, 33308), (94, 33419), (98, 33455), (99, 33476), (105, 33512), (107, 33548), (108, 33551), (155, 33932), (158, 33941), (186, 34022), (227, 34100), (228, 34103), (239, 34169), (240, 34178), (242, 34181), (247, 34199), (260, 34235), (268, 34292), (273, 34313),

Gene: Papez\_46 Start: 35129, Stop: 34302, Start Num: 66

Candidate Starts for Papez\_46:

(Start: 66 @35129 has 3 MA's), (80, 35057), (108, 34811), (152, 34427), (166, 34352),

Gene: Peridot\_71 Start: 43687, Stop: 45216, Start Num: 68

Candidate Starts for Peridot\_71:

(40, 43564), (48, 43606), (Start: 68 @43687 has 45 MA's), (69, 43702), (88, 43798), (90, 43822), (94, 43879), (107, 44008), (108, 44011), (111, 44032), (Start: 115 @44059 has 2 MA's), (118, 44080), (171, 44494), (175, 44515), (222, 44650), (234, 44731), (283, 45064), (284, 45067), (287, 45088), (288, 45097), (299, 45205),

Gene: Phasih\_65 Start: 42908, Stop: 44134, Start Num: 68

Candidate Starts for Phasih\_65:

(38, 42761), (41, 42785), (48, 42827), (Start: 68 @42908 has 45 MA's), (81, 42983), (110, 43238), (126, 43361), (188, 43778), (214, 43844), (229, 43910), (231, 43913), (243, 43991), (244, 43994), (263, 44099), (271, 44123),

Gene: Phinally\_5 Start: 2785, Stop: 4341, Start Num: 68

Candidate Starts for Phinally\_5:

(Start: 68 @2785 has 45 MA's), (90, 2920), (91, 2938), (94, 2977), (96, 3007), (105, 3070), (110, 3121), (Start: 115 @3157 has 2 MA's), (136, 3319), (173, 3538), (185, 3580), (199, 3643), (208, 3679), (213, 3715), (221, 3760), (222, 3775), (235, 3862), (258, 3952), (272, 4036), (277, 4063), (283, 4195), (284, 4198), (285, 4201), (293, 4279), (296, 4309),

Gene: Polka14\_75 Start: 46662, Stop: 47525, Start Num: 97

Candidate Starts for Polka14\_75:

(Start: 97 @46662 has 2 MA's), (107, 46758), (108, 46761), (111, 46782), (Start: 115 @46809 has 2 MA's), (118, 46830), (257, 47133), (279, 47295), (283, 47373), (284, 47376), (287, 47397), (288, 47406), (291, 47433), (299, 47514),

Gene: Rabbitrun\_78 Start: 47636, Stop: 48499, Start Num: 65

Candidate Starts for Rabbitrun\_78:

(Start: 65 @47636 has 3 MA's), (89, 47750), (92, 47813), (119, 48026), (144, 48302), (151, 48362), (152, 48365), (155, 48386), (158, 48395), (159, 48419), (166, 48440), (170, 48458), (172, 48467),

Gene: Raleigh\_38 Start: 29256, Stop: 30815, Start Num: 46

Candidate Starts for Raleigh\_38:

(15, 28959), (16, 28974), (17, 28989), (18, 29025), (36, 29160), (39, 29196), (Start: 46 @29256 has 2 MA's), (63, 29334), (Start: 68 @29346 has 45 MA's), (75, 29388), (78, 29397), (80, 29418), (90, 29496), (91, 29514), (96, 29583), (99, 29610), (101, 29622), (Start: 115 @29736 has 2 MA's), (125, 29811), (129, 29847), (133, 29880), (134, 29886), (141, 29955), (147, 30015), (151, 30048), (165, 30138), (237, 30435), (283, 30651), (284, 30654), (287, 30675), (288, 30684), (292, 30720), (294, 30735),

Gene: Ramsey\_69 Start: 45364, Stop: 46707, Start Num: 68

Candidate Starts for Ramsey\_69:

(26, 45112), (33, 45184), (40, 45241), (48, 45283), (Start: 68 @45364 has 45 MA's), (69, 45379), (88, 45475), (90, 45499), (96, 45586), (104, 45646), (110, 45700), (111, 45709), (Start: 115 @45736 has 2 MA's), (118, 45757), (135, 45892), (171, 46078), (175, 46099), (222, 46234), (283, 46555), (284, 46558), (287, 46579), (288, 46588), (299, 46696),

Gene: Rita\_76 Start: 46350, Stop: 47519, Start Num: 68

Candidate Starts for Rita\_76:

(41, 46227), (48, 46269), (Start: 68 @46350 has 45 MA's), (70, 46365), (75, 46392), (79, 46407), (81, 46425), (110, 46680), (114, 46698), (126, 46803), (157, 46950), (174, 47019), (188, 47061), (205, 47145), (209, 47154), (217, 47217), (231, 47298), (243, 47376), (244, 47379), (253, 47400), (261, 47436), (263, 47484), (270, 47502), (271, 47508),

Gene: RitaG\_71 Start: 45580, Stop: 46668, Start Num: 68

Candidate Starts for RitaG\_71:

(45, 45499), (Start: 68 @45580 has 45 MA's), (81, 45655), (88, 45691), (90, 45715), (96, 45802), (107, 45901), (108, 45904), (111, 45925), (Start: 115 @45952 has 2 MA's), (118, 45973), (257, 46276), (279, 46438), (283, 46516), (284, 46519), (287, 46540), (288, 46549), (291, 46576), (299, 46657),

Gene: Sanjuju\_4 Start: 2435, Stop: 3769, Start Num: 68

Candidate Starts for Sanjuju\_4:

(Start: 68 @2435 has 45 MA's), (69, 2450), (94, 2627), (96, 2657), (99, 2684), (105, 2720), (107, 2756), (110, 2771), (Start: 115 @2807 has 2 MA's), (118, 2828), (135, 2963), (153, 3068), (182, 3164), (242, 3332), (249, 3353), (258, 3374), (283, 3623), (284, 3626), (285, 3629), (293, 3707),

Gene: SchottB\_4 Start: 2583, Stop: 3653, Start Num: 67

Candidate Starts for SchottB\_4:

(8, 2040), (9, 2061), (Start: 67 @2583 has 3 MA's), (79, 2640), (87, 2694), (121, 2988), (168, 3381), (187, 3441), (189, 3456), (190, 3459), (196, 3480), (216, 3585), (218, 3603), (223, 3639),

Gene: Seagreen\_68 Start: 42620, Stop: 44155, Start Num: 68

Candidate Starts for Seagreen\_68:

(49, 42554), (Start: 68 @42620 has 45 MA's), (81, 42695), (88, 42731), (90, 42755), (107, 42941), (108, 42944), (111, 42965), (Start: 115 @42992 has 2 MA's), (118, 43013), (171, 43412), (175, 43433), (232, 43649), (257, 43754), (279, 43925), (283, 44003), (284, 44006), (288, 44036), (291, 44063), (299, 44144),

Gene: Shauna1\_67 Start: 43160, Stop: 44527, Start Num: 68

Candidate Starts for Shauna1\_67:

(49, 43094), (Start: 68 @43160 has 45 MA's), (81, 43235), (88, 43271), (90, 43295), (96, 43382), (107, 43481), (108, 43484), (111, 43505), (Start: 115 @43532 has 2 MA's), (118, 43553), (171, 43952), (175, 43973), (226, 44033), (251, 44105), (265, 44189), (275, 44222), (283, 44375), (284, 44378), (288, 44408), (291, 44435), (299, 44516),

Gene: ShiLan\_70 Start: 46343, Stop: 47512, Start Num: 68

Candidate Starts for ShiLan\_70:

(41, 46220), (48, 46262), (Start: 68 @46343 has 45 MA's), (70, 46358), (75, 46385), (79, 46400), (81, 46418), (110, 46673), (114, 46691), (126, 46796), (157, 46943), (174, 47012), (188, 47054), (205, 47138), (209, 47147), (217, 47210), (231, 47291), (243, 47369), (244, 47372), (253, 47393), (261, 47429), (263, 47477), (270, 47495), (271, 47501),

Gene: Shivanishola\_4 Start: 2785, Stop: 3819, Start Num: 113

Candidate Starts for Shivanishola\_4:

(Start: 113 @2785 has 1 MA's), (117, 2821), (127, 2884), (128, 2899), (Start: 130 @2920 has 1 MA's), (132, 2938), (135, 2962), (153, 3067), (182, 3163), (242, 3331), (249, 3352), (258, 3373), (283, 3622), (284, 3625), (285, 3628), (287, 3646), (290, 3709), (293, 3757),

Gene: Spartoi\_40 Start: 27031, Stop: 28128, Start Num: 61

Candidate Starts for Spartoi\_40:

(44, 26962), (Start: 61 @27031 has 1 MA's), (73, 27088), (82, 27133), (96, 27274), (99, 27301), (105, 27337), (107, 27373), (108, 27376), (110, 27388), (Start: 115 @27424 has 2 MA's), (118, 27445), (123, 27484), (135, 27592), (137, 27619), (149, 27700), (150, 27718), (184, 27823), (224, 27895), (235, 27955), (236, 27958), (259, 28042), (264, 28075), (269, 28087),

Gene: Starcevich\_69 Start: 45704, Stop: 46807, Start Num: 68

Candidate Starts for Starcevich\_69:

(41, 45581), (48, 45623), (Start: 68 @45704 has 45 MA's), (81, 45779), (90, 45839), (110, 46034), (126, 46157), (138, 46301), (139, 46322), (188, 46451), (214, 46517), (229, 46583), (231, 46586), (243, 46664), (244, 46667), (263, 46772), (271, 46796),

Gene: Stultus\_4 Start: 2433, Stop: 3818, Start Num: 68

Candidate Starts for Stultus\_4:

(Start: 68 @2433 has 45 MA's), (94, 2625), (96, 2655), (99, 2682), (105, 2718), (107, 2754), (110, 2769), (Start: 115 @2805 has 2 MA's), (118, 2826), (135, 2961), (153, 3066), (182, 3162), (242, 3330), (249, 3351), (258, 3372), (283, 3621), (284, 3624), (285, 3627), (287, 3645), (290, 3708), (293, 3756),

Gene: Toron\_77 Start: 47150, Stop: 48340, Start Num: 68

Candidate Starts for Toron\_77:

(21, 46868), (42, 47030), (52, 47087), (53, 47090), (Start: 68 @47150 has 45 MA's), (75, 47192), (78, 47201), (81, 47225), (95, 47345), (110, 47480), (119, 47540), (145, 47825), (174, 47912), (181, 47927), (243, 48185), (244, 48188), (255, 48218), (262, 48269), (263, 48293), (267, 48302), (270, 48311), (274, 48332),

Gene: Trax\_78 Start: 48336, Stop: 49199, Start Num: 65

Candidate Starts for Trax\_78:

(Start: 65 @48336 has 3 MA's), (89, 48450), (93, 48522), (116, 48711), (119, 48726), (140, 48966), (144, 49002), (148, 49041), (151, 49062), (152, 49065), (155, 49086), (158, 49095), (159, 49119), (166, 49140), (170, 49158),

Gene: Tweety\_72 Start: 45824, Stop: 46936, Start Num: 68

Candidate Starts for Tweety\_72:

(43, 45725), (51, 45758), (Start: 68 @45824 has 45 MA's), (77, 45872), (79, 45881), (81, 45899), (88, 45935), (90, 45959), (94, 46016), (106, 46121), (108, 46148), (110, 46160), (112, 46172), (Start: 115 @46196 has 2 MA's), (118, 46217), (255, 46553), (283, 46793), (284, 46796), (291, 46853), (295, 46901), (299, 46925),

Gene: VRedHorse\_68 Start: 42168, Stop: 43469, Start Num: 68

Candidate Starts for VRedHorse\_68:

(40, 42045), (48, 42087), (Start: 68 @42168 has 45 MA's), (81, 42243), (88, 42279), (90, 42303), (107, 42489), (111, 42513), (Start: 115 @42540 has 2 MA's), (246, 43056), (254, 43077), (283, 43326), (284, 43329), (295, 43434), (299, 43458),

Gene: Vivum\_71 Start: 45738, Stop: 47165, Start Num: 68

Candidate Starts for Vivum\_71:

(28, 45489), (31, 45519), (40, 45615), (48, 45657), (Start: 68 @45738 has 45 MA's), (69, 45753), (88, 45849), (90, 45873), (96, 45960), (104, 46020), (110, 46074), (111, 46083), (Start: 115 @46110 has 2 MA's), (118, 46131), (135, 46266), (171, 46452), (175, 46473), (257, 46773), (283, 47013), (284, 47016), (288, 47046), (291, 47073), (299, 47154),

Gene: Wachhund\_69 Start: 42634, Stop: 44055, Start Num: 68

Candidate Starts for Wachhund\_69:

(41, 42511), (48, 42553), (Start: 68 @42634 has 45 MA's), (81, 42709), (90, 42769), (110, 42964), (126, 43087), (138, 43231), (139, 43252), (160, 43441), (161, 43462), (167, 43522), (177, 43558), (181, 43567), (188, 43594), (205, 43678), (217, 43753), (231, 43834), (243, 43912), (244, 43915), (261, 43972), (263, 44020), (270, 44038), (271, 44044),

Gene: WillSterrel\_71 Start: 45180, Stop: 46355, Start Num: 68

Candidate Starts for WillSterrel\_71:

(41, 45057), (50, 45105), (Start: 68 @45180 has 45 MA's), (81, 45255), (110, 45510), (143, 45837), (156, 45861), (183, 45957), (185, 45963), (204, 46026), (215, 46059), (220, 46074), (223, 46086), (243, 46212), (244, 46215), (263, 46320), (271, 46344),

Gene: Yorick\_69 Start: 45654, Stop: 46880, Start Num: 68

Candidate Starts for Yorick\_69:

(27, 45402), (34, 45474), (41, 45531), (48, 45573), (Start: 68 @45654 has 45 MA's), (81, 45729), (90, 45789), (110, 45984), (126, 46107), (188, 46524), (214, 46590), (229, 46656), (231, 46659), (243, 46737), (244, 46740), (261, 46797), (263, 46845), (270, 46863), (271, 46869),